JUNE 29, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Metalworking Gets Set for the Expected July 1 Strike in Steel

Aluminum Target: U. S. Army

How Good Lighting Brightens Profits

Malleable Takes Jobs at 1200° F

Steel Keeps Pace in Space Race

New Furnace with Luminous Walls Gets Cost Cutting Recognition

Managers Expect 5% More Sales in Second Half

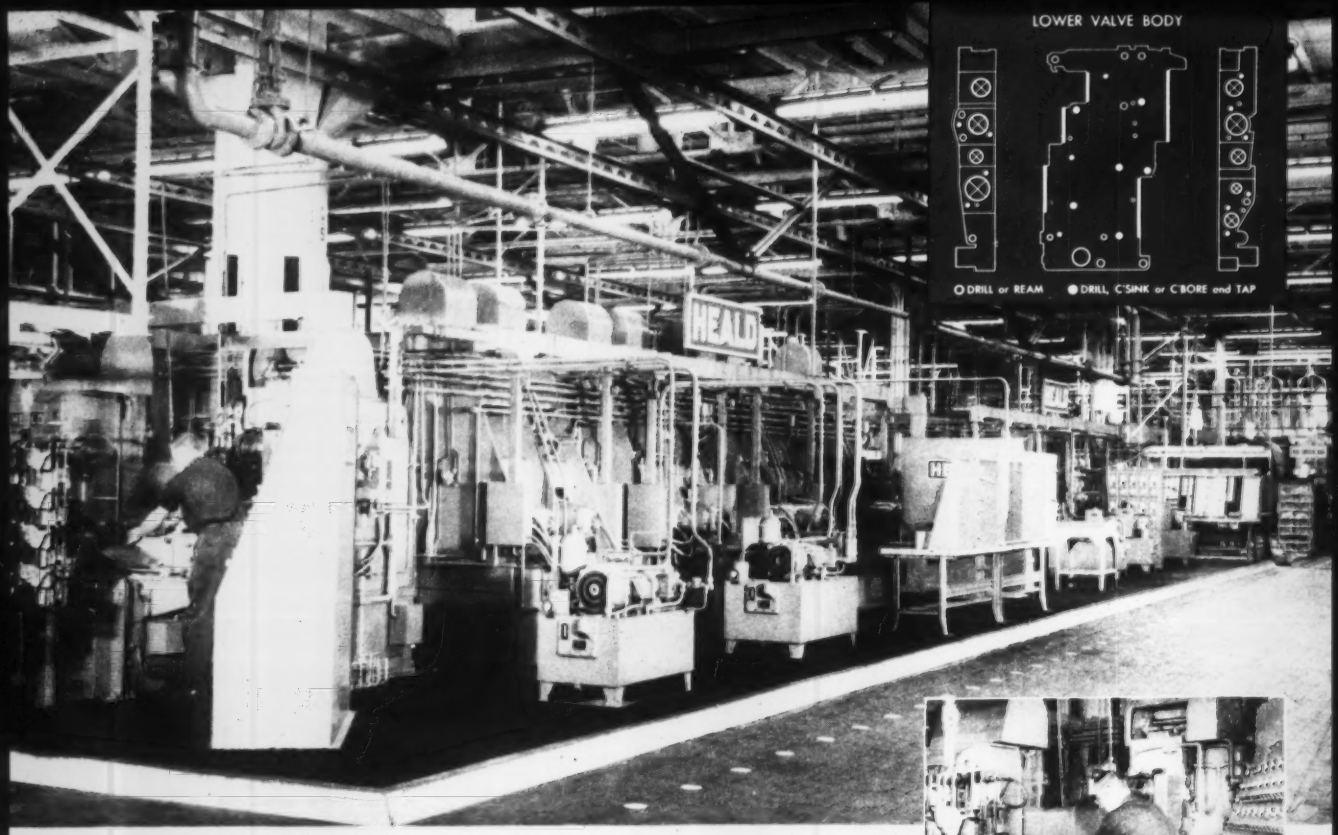
STEEL queried 6000 general managers of metalworking plants on second half business prospects. They look for:

- A 5 per cent sales increase.
- A 6.2 per cent profit gain.
- 1.5 per cent higher prices.
- 2.8 per cent higher costs.

—Page 45

COMPLETE CONTENTS
TURN PAGE

METALWORKING OUTLOOK
PAGE 37



HEALD AUTOMATED LINE performs

171 OPERATIONS

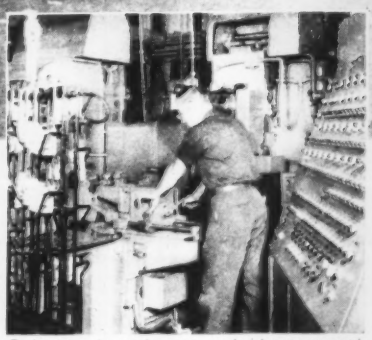
Two identical 39-station Bore-Matic transfer lines drill, bore, ream, tap, face, probe and gage 48 bores and 5 side faces of transmission valve bodies

REPRESENTING the ultimate in straight-line automation, these Heald Model S Bore-Matic transfer lines are speeding the precision production of valve bodies at one of America's leading automotive plants.

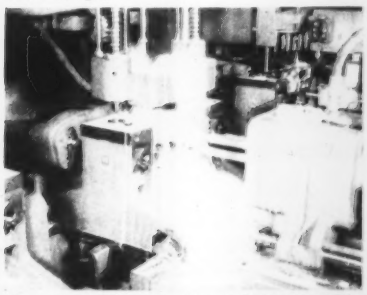
Each line consists of two 50-foot sections—a 19-station section for the small-bore and semi-finish facing operations and a 20-station section for core drilling, reaming and finish facing. A total of 171 operations (112 machining, 52 probing and 7 air gaging) are performed in a fully automatic palletized transfer line with a cycle time of 13 seconds for each station.

Compared to previous methods, the new Heald system results in less handling and locating of parts, fewer rejects, greater efficiency and substantially lower production costs.

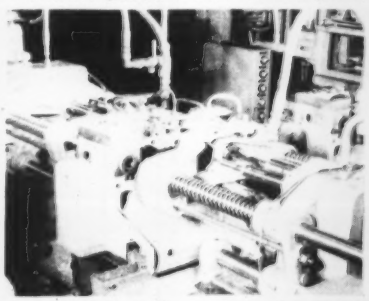
For complete information on this interesting installation, send for a copy of the February 1959 issue of The Heald Herald.



Parts come to machine on overhead conveyor and are semi-automatically loaded onto the transfer pallets. Push button control console for all stations is shown at right.



Tapping and drilling operation at Station 12 of Section 1. Probing station is shown in the background.



Core drilling of spool bores at Station 4 of Section 2. Bores are then semi-finish and finish reamed and air gaged for diameter.

IT PAYS TO COME TO HEALD!

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

This Week in STEEL

The Metalworking Weekly

June 29, 1959 Vol. 144—No. 26

Metalworking Outlook, p. 37

The Editor's View—Price Cutting Is Suicide! 43
▶ Metalworking Managers Expect Sales Volume to Rise 5 Per Cent in Second Half—STEEL's midyear forecast 45
Electric Firms Deny Collusion—Hearings planned in August.. 49
▶ Metalworking Gets Set for Expected July 1 Strike in Steel 50
U. S. to Sit in If USW Strikes—That's word from Finnegan.. 51
▶ Aluminum Target: U. S. Army—Drive to replace fading markets 52
Alcoa to Build in England—Counters Reynolds' move 53
▶ Lighting Can Brighten Your Profits—A STEEL study 54
How a Sales Tool Grew Up—Wales-Strippit's plant on wheels 59
Metalworking Firms Expand to Meet Needs of 1960s 76

Technical Outlook, p. 79

Automation Speeds Galvanizing Process—Hikes conduit output 80
▶ Luminous Wall Furnace Slashes Heat Treat Costs 82
Hot Mill Water Reclamation Holds Use to Well Capacity 84
▶ You Can Use Malleable Iron Castings for 1200° F Service 85
Inflating Missile Tank Imparts Strength to Thin Walled Stainless Structure 86
▶ Progress in Steelmaking—Steel Keeps Pace in Space Race 88
Machine Topics—New Machine Puts Radials in Elephant Class 94
Numerical Control Memory Simple, Reliable, Compact 96
Alloy Triples Rack Life—Used for furnace brazing of parts ... 97

Market Outlook, p. 109

Complete Index to Market News and Prices 109
Molybdenum Markets Expand—Up 50 per cent in three years 110
Steelworks operation chart and district ingot rates 114
Blast Furnace Production in May Breaks Record 114
Steel Rate Off, but Less than Expected 114
Scrap Holding in Face of Strike 126
Nonferrous Metals—Labor Key to Third Quarter 130

▶ Articles listed on cover.

WHERE TO FIND

Metalworking Pulse ..Turn page
Reader Service Center 5
Calendar of Meetings 10
Editorial & Business Staffs 16
Windows of Washington . 56
Mirrors of Motordom 63
The Business Trend 67
Men of Industry 71
Obituaries 74
New Products 99
New Literature 106
Advertising Index 135

Index available semiannually.

STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED JUNE 20	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	175*	174	172	138

*Preliminary.

STEEL's industrial production index advanced again to a record—probably the last one before fall. Steelmakers have started banking furnaces in anticipation of a strike. This will drag the index down a few points in the last week of June. The big dip will come over July 4.

Details on Page 67

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED JUNE 27	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled	130,000*	130,504†	117,372	92,277

(Source: Ward's Automotive Reports.) *Estimated. †Preliminary.

The best opening ten-day sales period for any June since 1955 is expected to keep auto production at current levels, except for the July 4 holiday, until well into July. Then model changeovers will take over, forcing the count down until the bottom is reached in August or early September.

Details on Page 64

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED JUNE 28*	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands) (AISI)	2,627	2,620	2,650	1,666
Index (1947-49=100) (AISI)	163.5	163.1	165.0	103.7
Percentage of capacity (STEEL)	90.0	92.5	94.0	63.0

*Estimated.

Wildcat strikes and curtailment of operations at some mills in preparation for a possible nationwide strike July 1 cut production last week under scheduled levels.

Details on Page 114

STEEL SCRAP PRICE COMPOSITE

	JUNE 24	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$36.50	$36.50	$34.00	$35.00

Scarcity of supplies and active demand for export material firmly supports the market for No. 1 heavy melting steel scrap at $36.50.

Details on Page 126

FINISHED STEEL PRICE INDEX

	JUNE 23	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	181.5

Producers will make no change in published price schedules on finished steel products pending outcome of present labor contract negotiations.

Details on Page 115

KNOW YOUR ALLOY STEELS . . .

This is the first of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

What is an Alloy Steel?

Here is an easy definition to remember: An alloy steel is a grade of steel in which one or more alloying elements have been blended to give it special properties that cannot be obtained in carbon steel.

Or, here is the metallurgical definition: An alloy steel is one in which the maximum specified content of alloying elements exceeds one or more of the following limits—

Manganese, 1.65 pct; Silicon, 0.60 pct; Copper 0.60 pct

or in which a definite range or a definite minimum quantity of any of the following elements is specified or required within the limits of the recognized commercial field of alloy steels: aluminum, boron, chromium up to 3.99 pct, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium, or any other element added to obtain a desired alloying effect.

As a rule, alloy steel is more difficult to make than carbon steel. There are more elements to be kept within specified ranges and, in general, the ranges of the alloying elements are comparatively narrow; hence the mathematical chances for producing off-heats are correspondingly increased. Moreover, most alloy steels require special reheating and cooling during processing to prevent such imperfections as flaking and cracking.

Surface imperfections must be removed from the billets by scarfing, chipping, or grinding. More exacting methods of testing and inspection are necessary to insure uniformity.

Where Does It Pay To Use Alloy Steel?

Generally speaking, it is advisable to use alloy steel when more strength, ductility, and toughness are required than can be obtained in carbon steel in the section under consideration. Alloy grades should also be used where specific properties such as corrosion-resistance, heat-resistance, and special low-temperature impact values are needed.

In some cases it requires considerable study to determine when and how to use a particular alloy steel to advantage in a product. Where there is any problem or doubt concerning its use, Bethlehem metallurgists will gladly give impartial advice on analysis, heat-treatment, machinability, and expected results.

In addition to manufacturing all AISI standard alloy steels, this company produces other than standard analysis steels and the full range of carbon grades.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

CARL S. HARVEY, *Technical Director, Lamson & Sessions, tells why...*

You overspend when you overspecify... on fasteners

Overspecifying can be costly in ordering fasteners . . . especially in view of the trend toward higher "physicals" and correspondingly higher component costs.

Here's a typical example: A customer specified AISI 1137 steel (a screw machine grade) for a nut. After a look at the "physicals" we recommended a cold forged nut of AISI 1030 steel (a straight carbon steel) and met all requirements at considerably lower cost to the customer.

In many instances we're recommending ordinary grades of carbon steel over the customer's specs of low alloy content material. Our improved heat treatment practices make the savings possible. Elementary cases, perhaps, but they happen every day!

Take Advantage of the specialized experience and facilities available to you through L&S. Leave reference to "chemistry" open. Tell us what you want in end results. Give us the "physicals" and tolerances—then stop! This helps us save *you* money, in both purchasing costs and assembly costs.

L & S Fastener Engineering helps you "tighten up" on...

- **PURCHASING COSTS**
- **INSPECTION AND HANDLING COSTS**
- **ASSEMBLY COSTS**

LAMSON & SESSIONS

5000 TIEDEMAN ROAD • CLEVELAND 9, OHIO

Plants in Cleveland and Kent, Ohio • Chicago and Birmingham

How TOCCO* Induction Annealing makes copper cable easier to handle in the field . . .

A world famous manufacturer of quality cable now treats its customers to the best with TOCCO-annealed cable that's easier to reel off, easier to splice and generally easier to handle in the field. Cable segments pass continuously through a TOCCO inductor coil at the rate of 23 feet per minute for the 800 mcm material illustrated. Many sizes of cable segments, up to one million circular mils, are annealed on one TOCCO unit.

TOCCO's many advantages over conventional annealing methods include:

1. TOCCO provides "bright annealing"—no discoloration.
2. TOCCO requires just a fraction of the space of conventional bell-type furnaces.
3. TOCCO's output is nearly four times that obtained by conventional annealing methods.
4. TOCCO equipment requires one operator as opposed to three required for the bell-type furnace operation.

Whether your products involve ferrous or nonferrous materials, look to TOCCO for an economical solution to your metal heating problems—annealing, brazing, hardening, melting or heating for forming or forging operations.

JUST PUSH A BUTTON

TOCCO

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today— NEW FREE Bulletin

The Ohio Crankshaft Co. • Dept. S-6, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening, Heat Treating and Annealing."

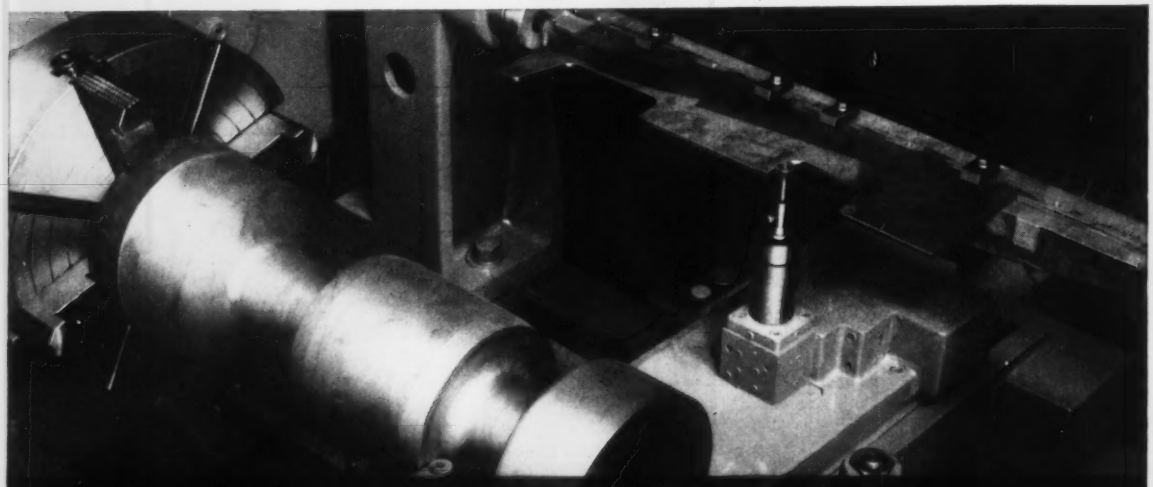
Name_____

Position_____

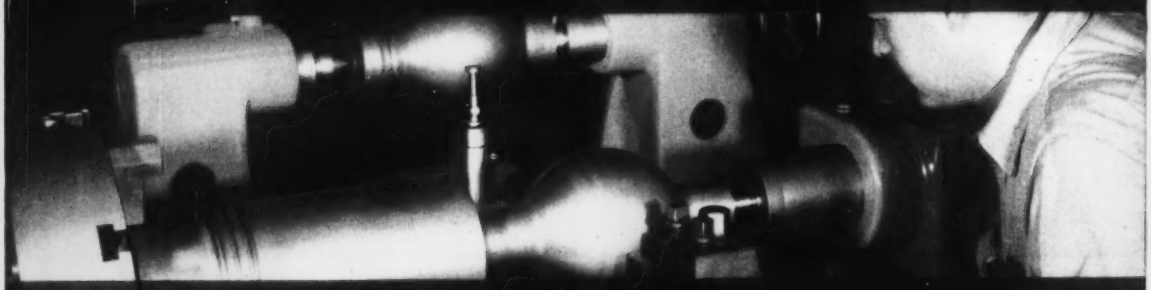
Company_____

Address_____

City_____ Zone____ State_____



trace from flat or round templates



with LeBlond's new 90° Tracer

available on 13", 16", 20", 25" and 32" Heavy Duty Lathes; 16", 20", 25", 32" and 40" Standard Duty Lathes

EXCLUSIVE ADVANTAGES: No loss of swing capacity (raises unnecessary). Tracer system allows full horsepower at tool.

All hydraulic controls conveniently located at apron — change from trace to conventional simply by adjusting two nuts at apron.

No overarms or other obstructions to loading templates — all components, including hydraulic pump and tank, integral with cross slide.

Positive mechanical linkage between stylus and tool slide — no strain on cross feed screw and nut.

Tolerance — .001" on diameter; .001" on shoulder length.

Write today for descriptive bulletin.

...cut with confidence

THE R. K. LEBLOND MACHINE TOOL COMPANY,
CINCINNATI 8, OHIO

LEBLOND of Cincinnati

World's Largest Builder of A Complete Line of Lathes.

Cost Crisis . . . How to Beat It

The cleavage in this silver dollar symbolizes the savings available to every metalworking company in the U. S. It also stands for STEEL's Second Cost Crisis Awards Competition. If your company has achieved lower unit product costs through more efficient use of materials, you may be qualified to enter. Four areas are explored: 1. Substituting a tailored shape for standard mill products, or vice versa. 2. Using a standard purchased material instead of a special, or vice versa. 3. Standardizing two or more separate purchases into one. 4. Substituting one alloy for another of the same basic material.

You may enter if you are a full-time employee of a metal producing company or metalworking plant; if you participated in the unit production cost saving project; and if your project was completed after Jan. 1, 1953.

A distinguished panel of STEEL readers, representing a cross section of metalworking managers, will judge the entries. The ten best will be declared winners, and the ten companies will be presented Atmos perpetual motion clocks as Production Efficiency Awards. All winning entries will be published in STEEL and recognition will be given to the people who made the cost reduction possible.

A four page Cost Crisis Awards Questionnaire, set up in kit form, is available from: Cost Crisis Editor, STEEL, Penton Bldg., Cleveland 13, Ohio. Entries must be postmarked not later than July 15, 1959. Send for your kit today.

This Is Job Security?

The union representative, flailing away at the nails in this fence, is erecting a protective barrier around a union member's job. He also keys in an informal series of three articles coming up in STEEL, "Quest for Job Security."

Next week, Associate Managing Editor John Morgan will delve into many aspects of the quest, such as the controversial interpretations of Section 2B of the steelworkers' contract, the clause which covers most of the "make work" provisions.

We Get Wires

GRANITE CITY, ILL.

STEEL:

DISCONTINUING SHRDLU IS LIKE ELIMINATING SUCH OR CAMPBELL. AM INCONSOLABLE.

CHARLSIE

This ten word wire is from disconsolate Charlsie (Vunovic), a secretary in the works manager's office at General Steel Castings Corp., Granite City, Ill., and a long-time reader of STEEL.

For awhile we were a trifle miffed to think that Charlsie preferred Shrdlu to us, but it appears she more than goes along with the change—she first sent in 15 names for this department, all of them candid; then came up with ten more and a request that we delete one of her previous suggestions because it's already used by another publication. (The contest closed June 23.)

We're going to nominate you as our champion name suggester. You're sure in the running with some 500 other entrants in the contest, Charlsie, and the judges are sifting more than 600 suggestions to see who'll be STEEL's Honorary Editor No. 1. The results of the contest will be announced in a few weeks. In the meantime, we've put a new set of headlines over the column.

How to Cover a Crisis

We have a letter from W. L. Milliren, district supervisor of production planning in Chicago for American Steel & Wire Div., U. S. Steel Corp. He requests copies of STEEL articles on the steel-labor crisis and comments: "We have followed closely your articles regarding the possibility of a strike as well as the editorial comment from

I believe _____ automobiles will be produced in the U. S. from Jan. 1 through Dec. 31, 1959.

Mail this to:
Ed Service
Beat-the-Experts
STEEL
Penton Bldg.
Cleveland 13,
Ohio

PRINT NAME _____
POSITION _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____

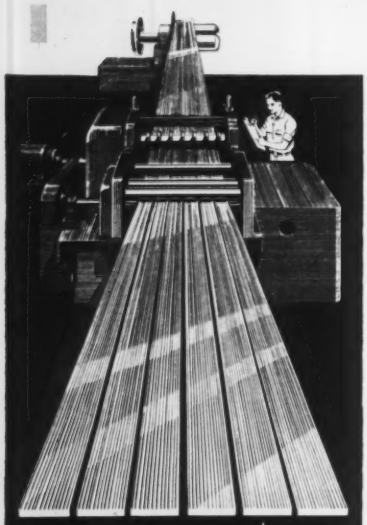
YODER

Rotary Slitters

Product dependability—integrity of manufacture—engineering for specific production needs have all contributed to establish Yoder equipment as the industry standard of excellence. Since 1909 Yoder-built machinery, including Pipe and Tube Mills, Roll Forming Equipment and Rotary Slitters, have earned world-wide customer satisfaction and recognition.

Profit from Yoder's years of engineering and service experience. Send today for the illustrated Yoder Slitter Book.

THE YODER COMPANY
5502 Walworth Ave., Cleveland 2, Ohio



ENGINEERING YODER MANUFACTURING

ROTARY SLITTING LINES
PIPE AND TUBE MILLS
(ferrous or non-ferrous)
COLD ROLL FORMING MACHINES

week to week. We feel that your magazine is doing an excellent job in spotlighting the problems facing the steel industry today."

Thank you, Reader Milliren, for those kind words. Perhaps you'd like a glimpse of how our editors directed the spotlights to hit those problems, particularly 1959's steel-labor negotiations.

Scene: Editorial Conference

Editor Walt Campbell is conferring with Associate Managing Editors John Morgan and Vance Bell about coverage of topics which will affect metalworking in 1959. The time: August, 1958.

Walt opens the meeting: "The most important service our editors can offer readers in a foreseeable crisis is to give them information they can act upon before a deadline falls. Take the case of the steel industry. It goes into contract negotiations next summer. We can inform metalworking managers of the probabilities of a work stoppage, define the issues involved, interpret the effects of possible settlements in terms of prices, foreign competition, national inflation, and perhaps most of all, the pattern of wage demands which metalworking companies will face as a result of the steel settlement."

Walt, John, and Vance then drew up a list of story possibilities and set Dec. 1, 1958, as the target date for the first article in our current series. It dealt with the steel inventory situation and warned steel companies to look to their steel stocks. As early as Dec. 22, 1958, STEEL predicted a six to nine week strike after the editors carefully analyzed the attitudes of steel producers and union officials.

On Feb. 9, STEEL began interpreting the 1959 labor-management crisis each week. In all, 39 stories or editorials on the crisis have been run in 30 weeks. We will continue to report on the 1959 negotiations in the weeks ahead.

That's how the spotlight is brought to bear on problems in metalworking, Reader Milliren. Thanks for jogging our memory.

Last Chance to Beat the Experts

This postmark gives the deadline for entries in STEEL's Beat-the-Experts contest. Guesstimates have ranged all over the lot, from 3.5 million to an optimistic 7.8 million. The object is to beat Detroit's experts at predicting U. S. passenger car production for 1959. Use the handy coupon for sending us your estimate. The winner will receive a 24 in. model of General Motors' Firebird III and the ten next best guessers will gather in full color prints of a dream car.

Whatever you guess, get into the fun. The miniature car is a honey, perfect in every detail, and a dream car color print would make a handsome addition to your office or den.

Get new-forging performance at 1/3 the cost from ERIE FOUNDRY REBUILDING SERVICE

Here at the Erie Foundry Rebuilding "Hospital", we disassemble and inspect your forging hammer, remachine worn surfaces, true bearings, replace broken parts, repair cracked parts. Once the hammer is reassembled, tested and put back in operation, it'll be as spry and sound as a new machine—but at one-third the cost!

Stands to reason that the leaders in forge manufacture for over 60 years should be the best source for forge repair.

Regardless of who made it, or how badly it's cracked, broken or worn, your forging hammer will recover most quickly at Erie Foundry's Rebuilding "Hospital". Write for the complete story.

ERIE

THE WORLD'S GREATEST NAME IN FORGING SINCE 1895

ERIE FOUNDRY CO.
ERIE 2, PA.

EF-59-02

announcing the most significant hoist development in 25 years!

NEW BALANCED P&H HEVI-LIFT ELECTRIC HOISTS

2,000 to 50,000 pound capacities

a new concept in the application of power and control to hoisting operations

What Is Balanced Design?

Balanced Design means that each part in the new P&H Hevi-Lift hoist has been balanced or matched with every other part for strength, temperature and performance characteristics. *There are no weak parts!* Each part is as strong and dependable as every other part.

As a result, in the new "Balanced Design" P&H Hevi-Lift, no single part is a limiting factor on overall hoist performance. Even under severe duty cycles, motor, gearing and brakes continue to function as designed without excess heating or abnormal wear. It is this unique balance of design and stability of performance that gives the new hoists their name — "Balanced Design P&H Hevi-Lifts."

What will new Balanced Design P&H Hevi-Lifts do for you? For one thing, you'll never again be plagued with petty hoist breakdowns that cost pennies to repair, but mean dollars in lost production. Simply stated, *the new Hevi-Lift will stand up longer under heavier duty cycles with less maintenance than any other hoist made today!*

Check These Features

The new Balanced Design P&H Hevi-Lifts are specifically built to provide the solution to every previously existing hoist operating and maintenance problem. For example, they feature: 1) Totally enclosed, weatherproof and dust-proof motor brakes and controls to eliminate maintenance worries, 2) Self-adjusting load brake with extra large linings, oil bath lubricated and cooled, that *never* requires tightening or tinkering, 3) Extra-large, leak-proof design gearcase, with all gears splash lubricated, 4) Lifetime lubrication of all components — there's not a single grease fitting on a Hevi-Lift, and no lubrication headache, 5) Extra-large low-pressure motor brake has only a short 1/32" stroke. There's no punishing hammer action, no pins, linkage or levers—and no need for cooling fans, 6) Alloy steel involute splined shafts and gears of machine tool quality for extra low tooth pressure, long life.

Get the whole story—see the complete line—in Bulletin H-55. Just clip the coupon on the other page and mail it in! Dept. 205, Harnischfeger Corp., Milwaukee 46, Wisconsin.

DESIGN

Standard 3-ton, standard headroom, 2-speed Balanced Design Hevi-Lift with plain trolley.

tear out and mail this coupon today!

P&H

HARNISCHFEGER

...quality and service for 75 years

Dept. 205F
HARNISCHFEGER CORP.
Milwaukee 46, Wis.

I'm interested in new Balanced Design P&H Hevi-Lift Hoists!

☐ Please send me a copy of Bulletin H-55.
☐ I'd like to discuss them with a sales engineer.

NAME .....

TITLE .....

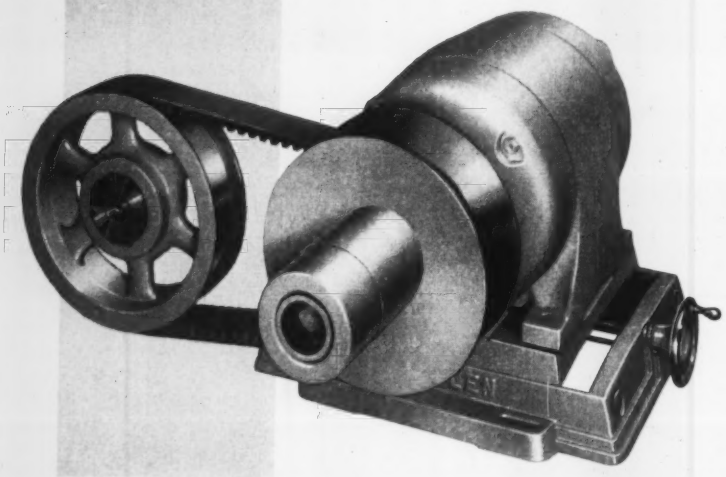
COMPANY .....

ADDRESS .....

CITY ..... STATE .....

LEWELLEN

NEW ..20 and 25 HORSEPOWER VARIABLE-SPEED PULLEYS



Here is a powerful, compact, variable speed drive in 20 and 25 h.p. ratings, offering—

Infinitely adjustable speeds while running.

3:1 speed range.

Constant torque characteristics plus 1.4 service factor.

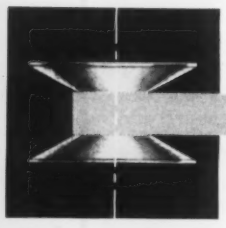
Selection of Companion Sheaves for wide choice of operating speeds.

Selection of Variable Belt lengths, for wide choice of shaft centers.

Selection of controlling devices and accessories for requirements of the application.

Accurate regulation, dependable performance.

Lewellen Variable Pulleys directly connect motor and machine—incorporate infinitely variable speeds, compactly and economically.



Write for Bulletin 580

LEWELLEN

Manufacturing Company, Columbus, Indiana

Distributors In All Industrial Areas. In Canada—Peerless Engineering Sales, Ltd., Toronto-Montreal

CALENDAR OF MEETINGS

July 13-15, Truck-Trailer Manufacturers Association: Semiannual meeting, Homestead Hotel, Hot Springs, Va. Association's address: 710 Albee Bldg., Washington 5, D. C. Executive manager: John B. Hulse.

July 29-Aug. 1, National Tool & Die Manufacturers Association: Summer board meeting, Grand Hotel, Mackinac Island, Mich. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.

Aug. 10-13, Society of Automotive Engineers: National west coast meeting, Hotel Georgia, Vancouver, B. C. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 18-21, Western Electronic Show and Convention: Cow Palace, San Francisco. Information: WESCON, 1435 S. La Cienega Blvd., Los Angeles 35, Calif.

Aug. 19-29, National Screw Machine Products Association: Sales conference, Wade Park Manor Hotel, Cleveland. Association's address: 2860 E. 130th St., Cleveland 20, Ohio. Executive vice president: Orrin B. Werntz.

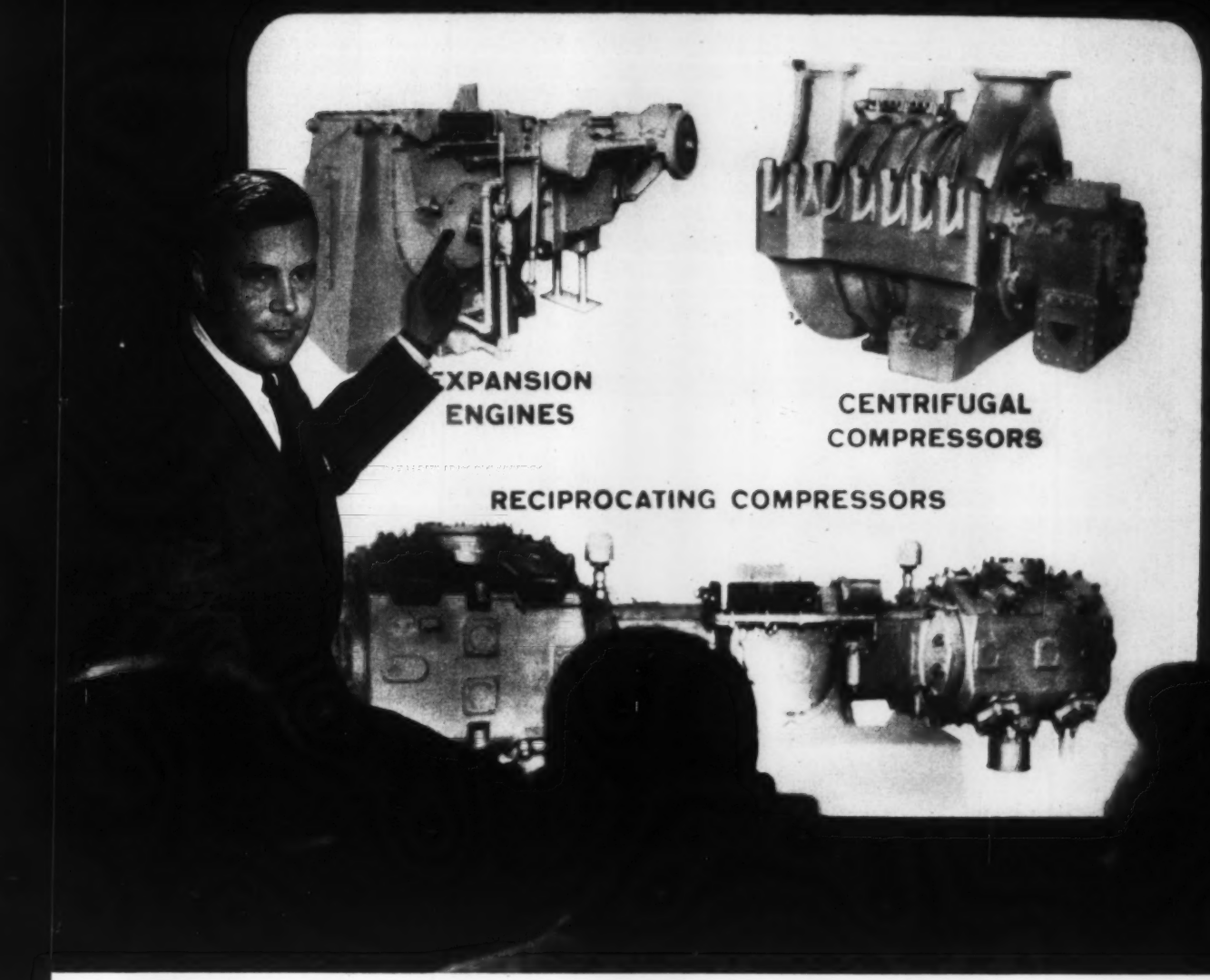
Aug. 31-Sept. 2, Metallurgical Society of AIME: Institute of Metals Division's conference on semiconductors, Statler-Hilton Hotel, Boston. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: R. W. Shearman.

Sept. 13-17, Pressed Metal Institute: Annual meeting, Stanley Hotel, Estes Park, Colo. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

Sept. 13-18, American Chemical Society: Fall meeting, Convention Hall, Atlantic City, N. J. Society's address: 1155 16th St. N. W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 14-17, Society of Automotive Engineers: National farm, construction and industrial machinery meeting, production forum, and display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 16-17, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.



George Edick, *Sales Manager Domestic Division, The Cooper-Bessemer Corporation, displays three types of units for oxygen production and explains...*

How Cooper-Bessemer can help you plan oxygen facilities to improve steel-making

It will pay you to check Cooper-Bessemer when you start to plan oxygen facilities for steel production because:

Unbiased analysis. Since we offer all types and sizes of compressors and expansion engines, we can apply the units best suited to your specific needs.

Integrated installation. We can provide complete engineering service for the entire power-compression-expansion operation, including En-Tronic controls for most economical operation.

Unmatched service. Our outstanding field service and warehouse facilities nearby assure prompt attention to your operating needs... at start-up time and for the years to come.

Call our nearest office for further details.

BRANCH OFFICES: Grove City • New York • Chicago • Washington San Francisco • Los Angeles • Houston • Dallas • Odessa • Pampa Greggton • Seattle • Tulsa • St. Louis • Kansas City • Minneapolis New Orleans • Shreveport • Casper • Gloucester

SUBSIDIARIES: Cooper-Bessemer of Canada, Ltd.... Edmonton • Calgary Toronto • Halifax

C-B Southern, Inc.... Houston

Cooper-Bessemer International Corporation... New York • Caracas Mexico City

Cooper Bessemer

GENERAL OFFICES: MOUNT VERNON, OHIO

ENGINES: GAS - DIESEL - GAS-DIESEL
COMPRESSORS: RECIPROCATING AND CENTRIFUGAL, ENGINE OR MOTOR DRIVEN

Dynex, Inc., Pewaukee, Wisconsin, produces single- and double-acting cylinders from Republic ELECTRUNITE Special Smooth I.D. Hydraulic Cylinder Tubing.

Republic ELECTRUNITE Tubing...

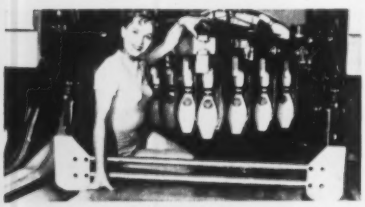
OFFERS MORE TUBE PER DOLLAR

Dynex, Inc., Pewaukee, Wisconsin, has switched to Republic ELECTRUNITE® Special Smooth I.D. Hydraulic Cylinder Tubing in their manufacturing operations. The switch was made because ELECTRUNITE's special smooth, micro-inch inside finish eliminated costly honing, resulting in a better end product at a lower unit cost. Typical example of how ELECTRUNITE is providing thousands of manufacturers and fabricators with "more tube per dollar."

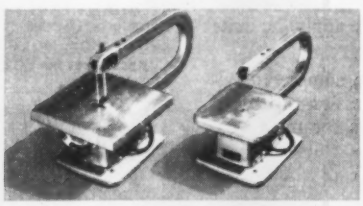
ELECTRUNITE, produced by the world's largest manufacturer of electrically welded tubing, is made from highest quality flat-rolled steel, carefully controlled through every step of manufacturing.

ELECTRUNITE Special Smooth I.D. Hydraulic Cylinder Tube is available in sizes up to 4½" O.D. in walls up to .187". ELECTRUNITE Mechanical Tubing is available in round sizes up to 6" O.D. and squares and rectangles up to periferies of 20 inches. Wide range of wall thicknesses, some up to .250" wall.

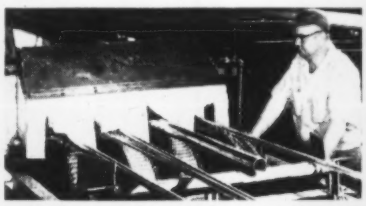
Call your Republic representative to see how ELECTRUNITE can offer you "more tube per dollar", too. Or, write direct.



AMF CUTS COSTS, builds a better pinspotter with Republic ELECTRUNITE Mechanical Tubing. Saved $34,000 in boring, grinding, and material costs.



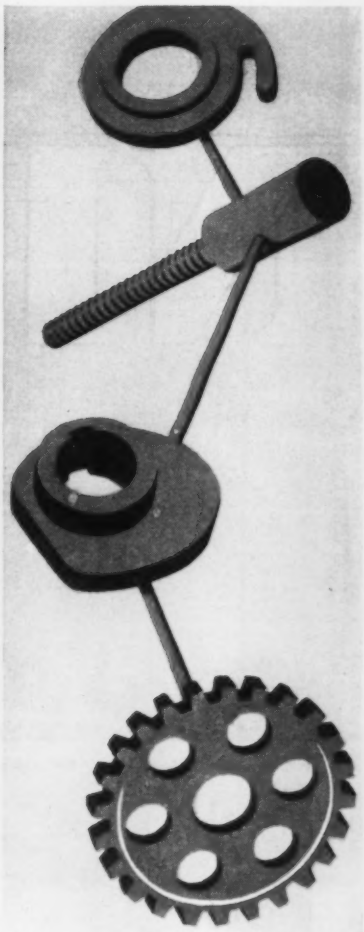
SAVINGS IN TIME AND MATERIALS by Syncro Corporation, Oxford, Michigan, by using ELECTRUNITE Square and Rectangular Tubing for blade-yokes.



GET REPUBLIC ELECTRUNITE Stainless Steel Tubing in sizes from ¼" through 5" O.D. Bright annealed finish available in sizes up to 4" O.D.

TRUSCON STEEL "BUDGET BUILDINGS" ... 3 WEEK DELIVERY! Fast, economical way to provide warehousing, enlarge manufacturing facilities, erect field offices at lowest cost. Truscon Steel "Budget Buildings" are available in widths of 12 to 28 feet, in 10- and 12-foot heights . . . and in widths of 32 to 48 feet, in 12- and 14-foot heights, in any lengths necessary. Roofing, siding, windows, doors, and hardware shipped as a package with 3-week delivery to your job site.

HERE'S PROOF OF MACHINABILITY—This spiral milled shaft is the heart of a ratchet-type screw driver. It bears the full load of the twisting operations. Excellent machinability of Republic Cold Drawn Steel helps the manufacturer achieve uniform high quality in each shaft. Cold drawing provides additional benefits in improved mechanical properties. Completed parts are stronger and longer wearing. Improved appearance, too. Call your Republic representative, or write direct.



REPUBILC CARBON COMPATIBLE IRON POWDERS cut costs, broaden the application of powder metallurgy. Big news in powder metallurgy continues to come from Republic. As a result of project 501, Republic has developed and is producing at its Toledo, Ohio, plant, two types of carbon compatible iron powders. Designated as types MS and HS6460, these powders represent a major advancement for the powder metallurgy industry. Use the convenient coupon below.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. ST-7973-B
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on the following products:

- ☐ ELECTRUNITE Hydraulic Cylinder Tubing
- ☐ Mechanical Tubing ☐ Stainless Steel Tubing
- ☐ Truscon "Budget Buildings" ☐ Line Tubing
- ☐ Republic Cold Drawn Steel
- ☐ Republic Carbon Compatible Iron Powders

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____

NOW READY . . . the

NEW

edition of industry's favorite guidebook for transmission design and maintenance economy.

COMPLETE CATALOG No. 57

REPLACES THESE THREE CATALOGS

No. 56 No. SC-3 No. OP-1

Lists NEW Gears and gear information. NEW expanded line of Sprockets and Chain for any drive ¼″ to 2″ pitch. NEW OPTIMOUNT helical geared Speed Reducers, shaft mounted and base mounted. NEW types and sizes in every product line. 664 pages, with 58 pages of improved selection charts and engineering information to help you simplify transmission planning. Boston Gear Works, 73 Hayward St., Quincy 71, Mass.

YOUR COPY IS NOW AVAILABLE FROM . . .

YOUR NEARBY **BOSTON Gear** DISTRIBUTOR

— STANDARDIZATION PAYS —®

***NOW* 9496**

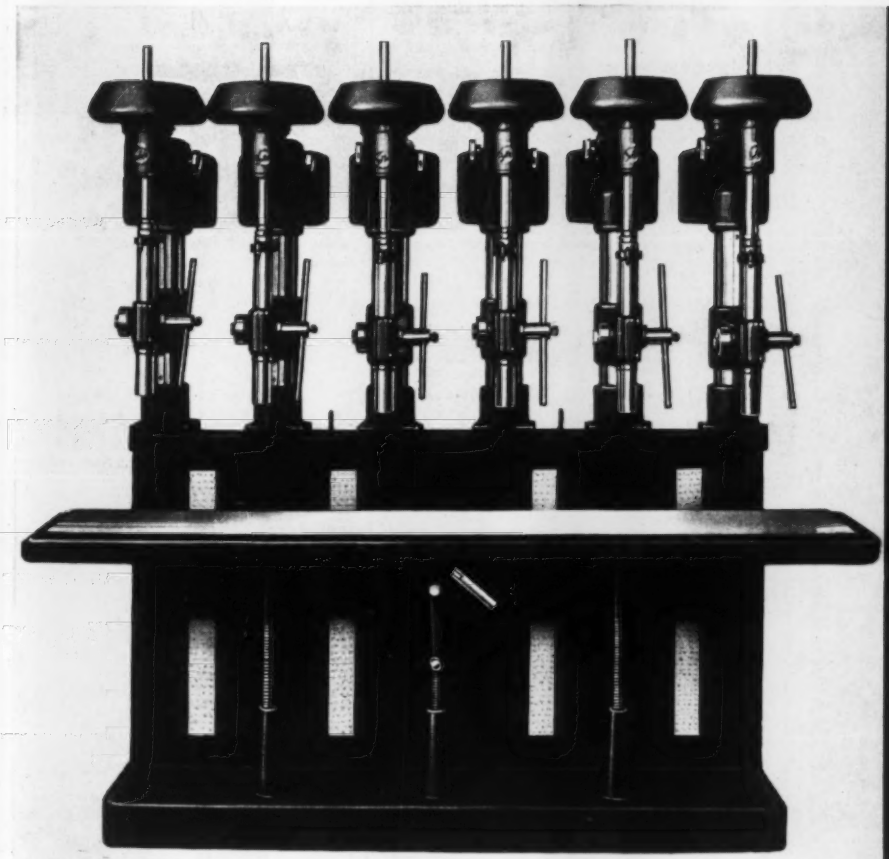
STANDARDIZED POWER TRANSMISSION PRODUCTS

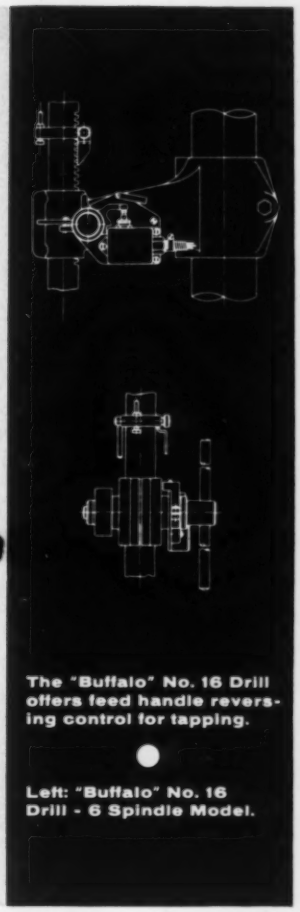
Stock Gears • Sprockets and Chain
Speed Reducers • Bearings
Pillow Blocks • Shaft Supports
Couplings • Pulleys

FROM STOCK!

For nearest Distributor LOOK UNDER "GEARS" in the "Yellow Pages"

Advt. copyright by Boston Gear Works





The "Buffalo" No. 16 Drill offers feed handle reversing control for tapping.

Left: "Buffalo" No. 16 Drill - 6 Spindle Model.

THESE PRODUCTION TOOLS

QUICKLY PAY FOR THEMSELVES!

"Buffalo" No. 16 Drilling Machines Faster, more profitable production drilling is yours with the "Buffalo" No. 16 Drill. Operators like its handy controls and drilling ease. More accurate work, longer useful tool life, lower overall production costs are assured by these No. 16 features:

- 5-Speed V-Belt Drive.
- 4 Rates of Power Feed.
- Hardened Tool Steel Clutch Members.
- Hand-Scraped Table Ways.

Capacity of the No. 16 is ⅞" in mild steel. Available in floor, bench and pedestal models, 1 to 6 spindles.

Ask your "Buffalo" machine tool dealer to demonstrate the No. 16 Drill. Or mail convenient coupon below.

BUFFALO FORGE COMPANY

BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

Please send me full details on "Buffalo" No. 16 Drilling Machines.

(Name and Title)

(Company)

(Street Address)

(City) (Zone) (State)

DRILLING ■■■ PUNCHING ■■■ SHEARING ■■■ BENDING

"Samson" Shot
(chilled iron)
"Angular" Grit
ANGULAR GRIT

AMERICA'S LEADING METAL ABRASIVES

The four most famous names in metal abrasives provide a size and type of shot or grit to meet every blast-cleaning need. Write for literature and recommendations.

PITTSBURGH CRUSHED STEEL CO.
Arsenal Sta., Pittsburgh 1, Pa.

MALLEABRASIVE
MALLEABLIZED SHOT and GRIT

SSP TRU-STEEL SHOT
TRU-STEEL HIGH CARBON STEEL SHOT

man conquers mountains

And, some day, man will also conquer cancer. With your help.

Guard your family . . . fight cancer with a checkup and a check

AMERICAN CANCER SOCIETY

STEEL
the Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH

Editor, WALTER J. CAMPBELL

Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY .....Market Editor
ROBERT F. HUBER .....Machine Tool Editor
HARRY CHANDLER .....Copy Editor
GLENN W. DIETRICH....Associate Copy Editor
FRANK R. BRIGGS .....Associate Editor
ROBERT O. JAYNES .....Associate Editor
AUSTIN E. BRANT .....Associate Editor
ROSS WHITEHEAD .....Associate Editor
GEORGE J. HOWICK .....Associate Editor
DERRY EYNON .....Assistant Editor
NEIL C. ROBERTS .....Assistant Editor
DONALD E. HAMMERSTROM..Assistant Editor
JOHN TERESKO .....Assistant Editor
WILLIAM M. OLDS .....Assistant Editor
MARY T. BORGERHOFF .....Assistant Editor
MARY ALICE EARLY .....Assistant Editor
EILEEN CORTES .....Assistant Editor
MARY ANN STUVE .....Editorial Assistant

JANE WEDGE, Editorial Assistant

THOMAS H. BRYAN, TOM WELSH, Art Editors

IRENE KASNER, Editorial Service

Resident Editors

New York 17 .....60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
BRIAN WILSON
Murray Hill 2-2581

Chicago 11 .....520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 .....2837 Koppers Bldg.
WILLIAM V. WALLACE—Atlantic 1-3211

Detroit 35 .....15800 W. McNichols Rd.
A. DONALD POSTMA—Broadway 3-8150

Washington 4 ....1123 National Press Bldg.
JOHN R. BOTZUM—Executive 3-6849

Editorial Correspondents

Buffalo—Emerson 5385 ....GEORGE E. TOLES
Youngstown—Riverside 7-1471..GEO. R. REISS
Cincinnati—Beechmont 1-9607...DICK HAVLIN
Birmingham—Birmingham 3-1121 R. W. KINCEY
St. Louis—Garfield 1-1212. HAMILTON THORNTON
Houston—Hudson 6-5236 .....ROBERT SHIRK
Los Angeles—Webster 5-1234..NORMAN LYNN
San Francisco—Yukon 6-5151 EDWIN HAVERTY
Seattle—Melrose 2-1895 .....R. C. HILL
Toronto, Canada—Empire 4-9655..F. S. TOBIN
Birmingham, England .....J. A. HORTON
Brussels, Belgium .....PAUL DE KEYSER
Dusseldorf, Germany, DR. HERBERT GROSS

BUSINESS STAFF

Business Manager, D. C. KIEFER

Asst. Business Mgr.....C. A. TALLINGER JR.
Advertising Service Mgr. ...DORIS MITCHELL
Production Manager .....A. V. ANDERSON
Classified Advertising .....EVELYN DIETZ
Promotion Director .....S. F. MARINO
Market Research Mgr. ....T. M. BALLANTINE
Circulation Director .....J. C. GERNHARD
Distribution Manager .....G. R. EBERSOLE

Reprints, JUNE SCHILENS

Advertising Representatives

New York 17 .....60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. .....12 Farmstead Lane
CALVIN FISHER JR.
Orchard 7-1756

E. Rochester, N. Y. .....217 Ridgeview Dr.
HAROLD A. DENNIS—Browning 1-2105

Pittsburgh 19 .....2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 .....Penton Bldg.
J. K. GILLAM, N. W. MANNING—Main 1-8260

Cincinnati 6 .....2215 Victory Parkway
E. L. FRANKE—Parkway 1-0711

Detroit 35 .....15800 W. McNichols Rd.
DONALD C. HYDE
Broadway 3-8150

Chicago 11 .....520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER, RICHARD BIRDSONG
Whitehall 4-1234

Los Angeles 36 .....5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 .....57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Ga. .....1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

Clearwater, Fla. .....1954 Jeffords Dr.
H. G. ROWLAND—(Clearwater) 39-9493

Dallas 35 .....818 Exchange Bank Bldg.
JAMES H. CASH—Fleetwood 1-4523

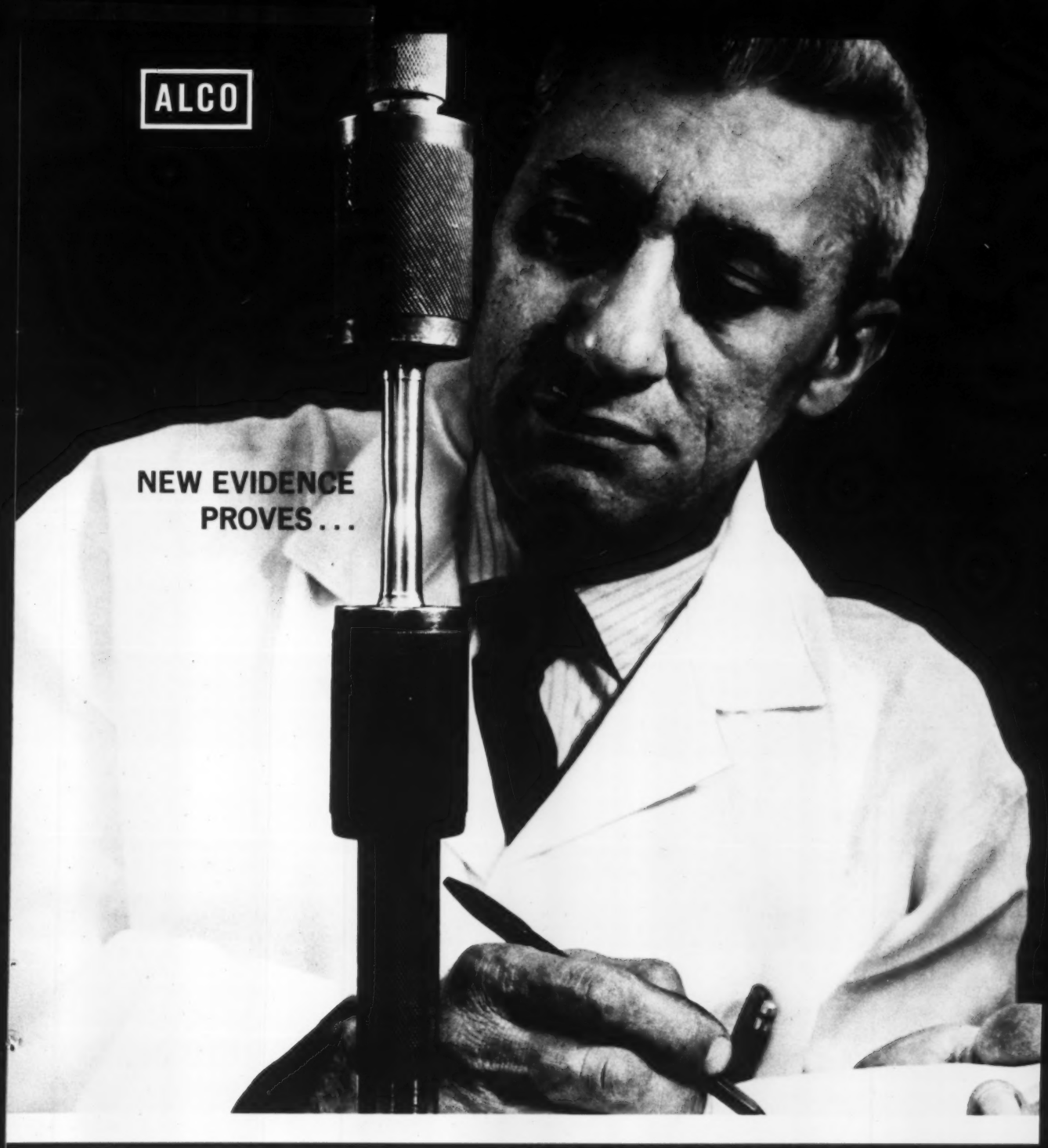
BPA

NBP

Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio
MAin 1-8260

GEORGE O. HAYS .....Chairman
RUSSELL C. JAENKE .....President
FRANK G. STEINEBACH .....Vice President and Secretary
FRANK O. RICE .....Vice President
JOSEPH P. LIPKA .....Treasurer and Assistant Secretary

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors, and National Business Publications Inc.



ALCO's Hi-Qua-Led Steel Forgings can raise your profit... without lowering your standards

CONCLUSIVE EVIDENCE:

NO CHANGE IN PROPERTIES
with the addition of lead in ALCO's

For the first time, here is published evidence establishing the superiority of one forging steel over all others. The evidence comes from actual production Hi-Qua-Led Steel forgings, tested by ALCO Products, Inc. and confirmed by a variety of customers after extensive value analysis.

The results as reported on these pages prove there are *no significant differences* between the physical properties of ALCO Hi-Qua-Led Steel forgings and unleaded forgings of the same grade. Couple this fact with Hi-Qua-Led's outstanding *machinability* advantages and you have the reasons why ALCO's unique leaded steel is the number one choice for forgings.

The tensile-test data compare physical properties of three steels: AISI 1045, 4140 and 4340, to the same grades (10L45, 41L40 and 43L40) with the ALCO lead addition. They prove that when lead is added by ALCO's special patented process there is no measurable effect upon yield and tensile strengths, and ductility.

Cost-cutting Hi-Qua-Led Steel forgings are available *only* from ALCO, in any steel grade. No other forgings can offer the benefits of Hi-Qua-Led: an increase in your manufacturing profits due to the superior machinability–along with maintenance of your product-quality standards because there is no loss in mechanical properties.

GRADES OF STEEL TESTED
1045 (216 Bhn) **vs.** **10L45*** (225 Bhn)
4140 (260 Bhn) **vs.** **41L40** (270 Bhn)
4340 (285 Bhn) **vs.** **43L40** (292 Bhn)

OTHER TEST RESULTS

FATIGUE STRENGTH—To 340 Brinell, there is no difference in fatigue strength between Hi-Qua-Led Steel forgings and regular forgings of the same grade. Above 340 Brinell, in smooth bar properties, there is a gradual drop-off in Hi-Qua-Led forgings to about 10 per cent at 400 Brinell. In notch-bar properties, there is no difference.

SURFACE FATIGUE—In the AISI 1000 series steels, Hi-Qua-Led Steel forgings have 30 per cent higher resistance to surface fatigue than their non-leaded counterparts. In the 4100 steels, Hi-Qua-Led has a 15 per cent advantage. In the 4300 series, there is no significant difference.

HARDENABILITY—Customers report "no observable difference" and "more uniform hardening and structure" with Hi-Qua-Led Steel forgings.

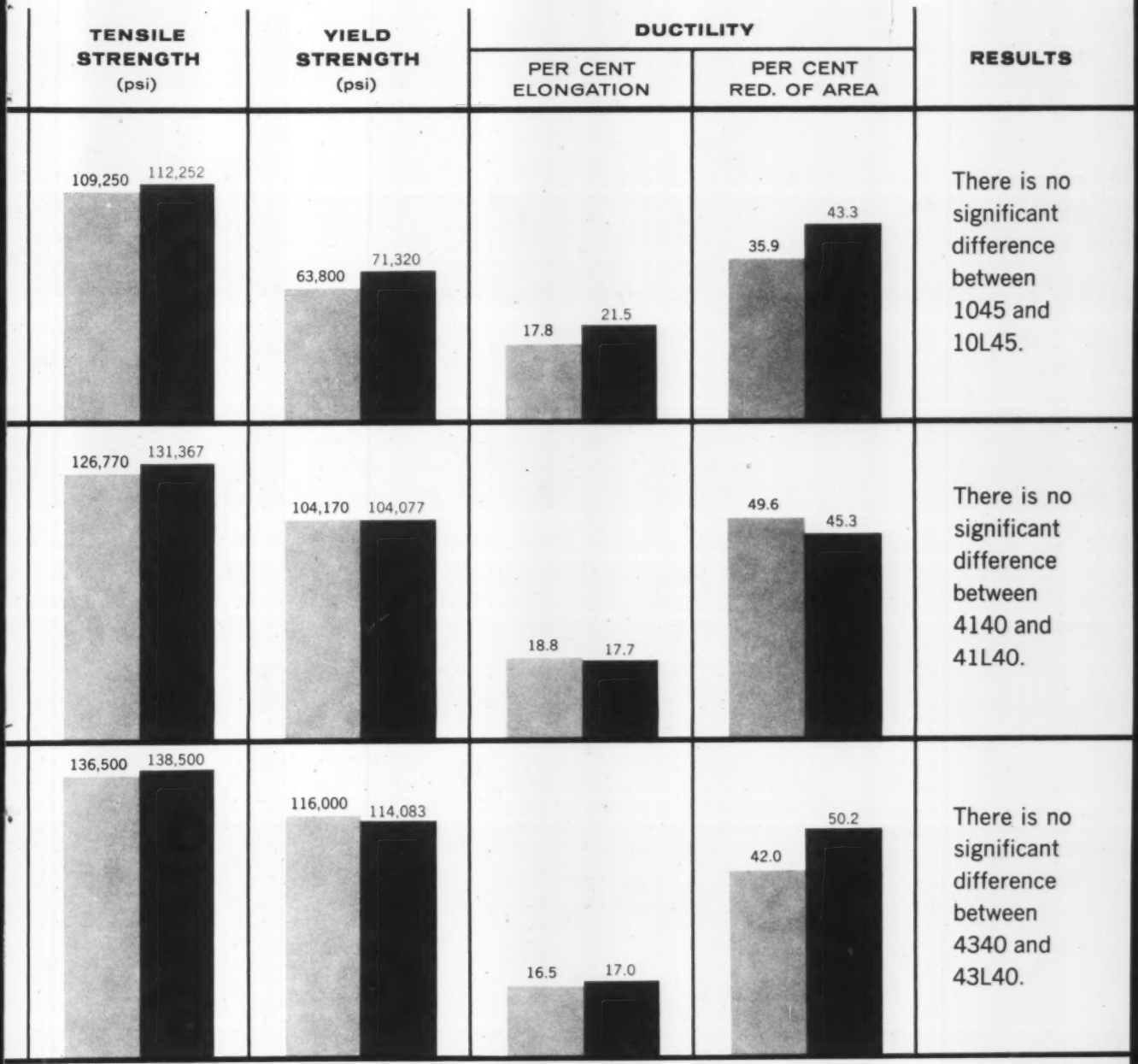
WELDABILITY—There is no difference in the welding of Hi-Qua-Led Steel forgings and regular forgings of the same grade. Hi-Qua-Led is approved for ASME Code welding *(Special Case Ruling No. 1253)*.

CHARPY IMPACT—For 1045 and 4140 series steels, Hi-Qua-Led Steel forgings exhibit better properties than their unleaded counterparts. In 4340, there is no difference between Hi-Qua-Led and regular forgings.

ALCO

EXCEPT BETTER MACHINABILITY

special process Hi-Qua-Led Steel®



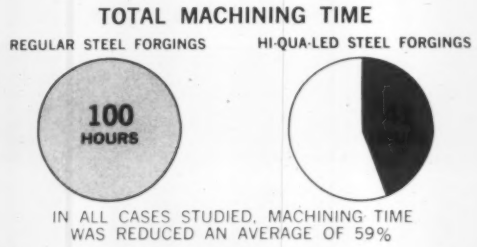
*The "L" designator in any AISI number denotes Hi-Qua-Led Steel. For example, AISI 1045 becomes 10L45 in Hi-Qua-Led Steel.

For a report on Hi-Qua-Led Steel machinability, turn page . . .

HI-QUA-LED STEEL GIVES YOU MACHINING ADVANTAGES UNMATCHED BY ANY OTHER FREE-MACHINING STEEL

HI-QUA-LED STEEL REDUCES MACHINE TIME MORE THAN 50 PER CENT

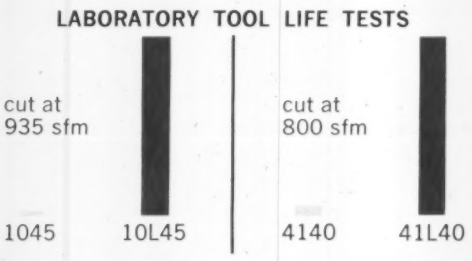
The submicroscopic addition of lead to Hi-Qua-Led Steel changes two basic machining factors. First, the shear angle is increased, reducing the heat generated and the force required for plastic flow. Second, frictional properties of the chip flowing over the tool are reduced, generating less heat and causing less chip welding, and further reducing the force requirement. These changes permit much higher speeds and feeds. Translated into machine time, in most cases they mean more than a 50 per cent saving, floor to floor.



IN ALL CASES STUDIED, MACHINING TIME WAS REDUCED AN AVERAGE OF 59%

HI-QUA-LED STEEL INCREASES TOOL LIFE UP TO 100 TIMES

In laboratory tests by a major tool maker, cutting at 935 sfm, a tool lasted one minute on standard 1045 and 100 minutes on Hi-Qua-Led 10L45 from the same heat. On standard 4140, at 800 sfm, a tool lasted one minute. On Hi-Qua-Led 41L40 from the same heat, at the same surface speed, the tool lasted 18 minutes. Of course, you probably won't cut Hi-Qua-Led at these speeds (although you can). But even at more normal speeds, customers report tool life increases of 200%, 700%, even 1600%.



HI-QUA-LED STEEL FORGINGS ARE MADE ONLY BY ALCO

There are many leaded steels on the market, but there is only one Hi-Qua-Led Steel. It is available only from ALCO, and only in forgings.

You can get Hi-Qua-Led Steel forgings in any steel grade. Each heat of ALCO steel is carefully made in 60-ton open hearths, assuring strict control of steel chemistry to specification.

For complete information on Hi-Qua-Led Steel's machinability and physical characteristics contact the nearest ALCO sales office, or send for the free 40-page reference booklet: "Technical Data, Hi-Qua-Led Steel Forgings." Write to ALCO Products, Inc., Dept. 159, Schenectady 5, N. Y.

SIZES AVAILABLE

Open die forgings—rectangular
Maximum width—48 in.
Maximum height—32 in.
Maximum length—40 ft
Maximum weight—36,000 lb
Minimum weight—1,000 lb

Open die forgings—shafts
Maximum OD—36 in.
Maximum length—40 ft
Maximum weight—36,000 lb
Minimum weight—1,000 lb

Mandrelled ring forgings
Maximum OD—82 in.
Minimum OD—24 in.
Maximum width—60 in.

Rolled ring forgings
Maximum OD—160 in.
Minimum OD—18 in.
Maximum width—24 in.

See ALCO's *catalog in Sweet's Product Design Catalog File. See Thomas' Register for complete product listings and addresses.*

ALCO

ALCO PRODUCTS, INC.
NEW YORK
SALES OFFICES IN PRINCIPAL CITIES

LOCOMOTIVES · DIESEL ENGINES · NUCLEAR REACTORS · SPRINGS · FORGINGS · WELDMENTS · OIL FIELD EQUIPMENT

What M&T is doing in metal finishing

Steel bumper section with ordinary chromium after 16 hours CASS test

"Duplex Chromium" after 48 hour CASS test — still perfect!

New M&T Chromium Plating Discovery offers most economical way to improve durability

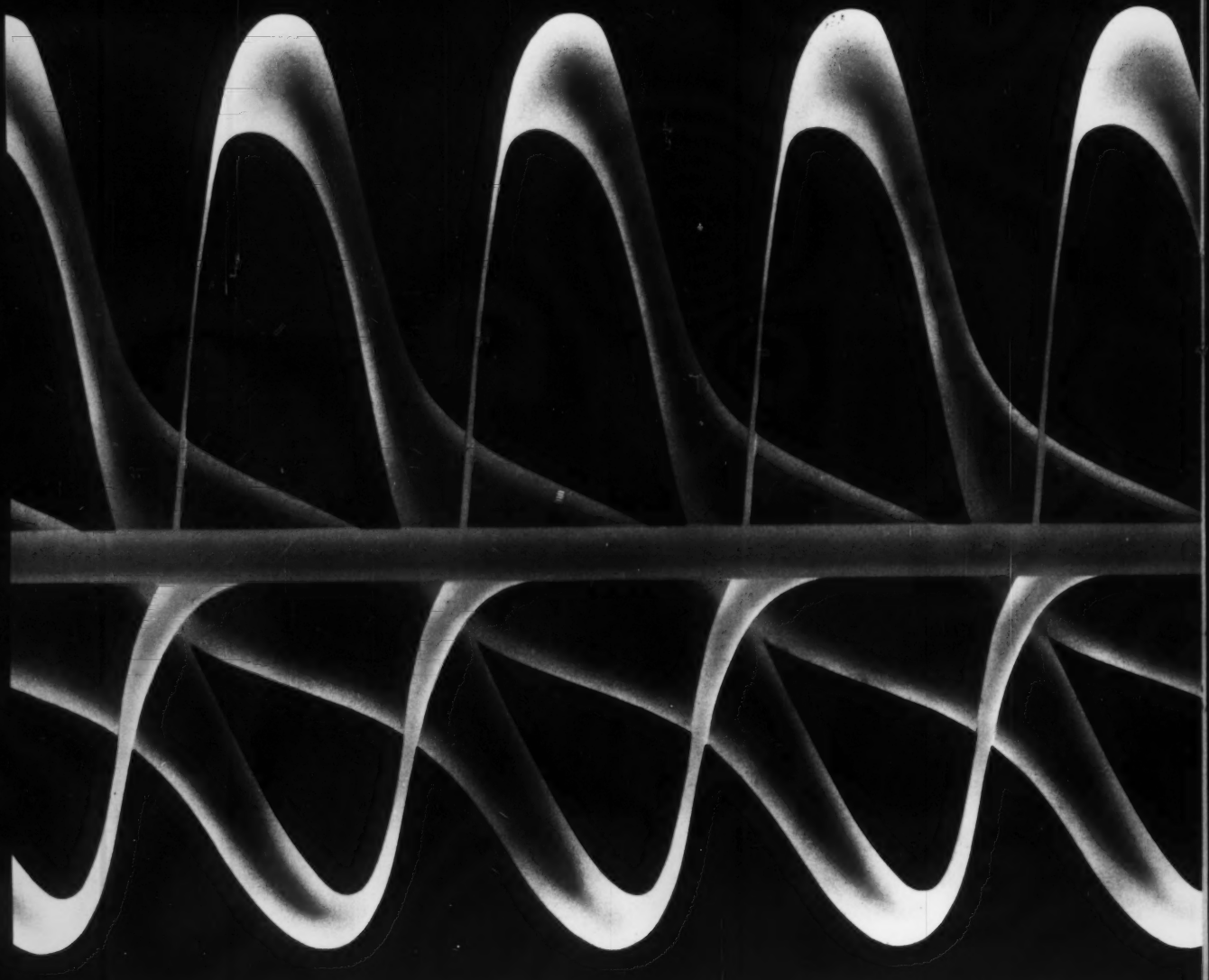
Durability of chromium plated parts in severe, accelerated corrosion tests has been increased up to 500% by the revolutionary Unichrome "Duplex Chromium" Plating Process developed by Metal & Thermit.

Using M&T "Duplex Chromium" to increase the thickness of chromium approximately five times from the usual average of 10 millionths of an inch enables parts to maintain an ASTM durability rating of 8 or better (10 is *perfect*)! This thicker and more uniform chromium plate radically increases survival time in modern accelerated tests by many times over.

M&T "Duplex Chromium" consists of a layer of Unichrome Crack-Free Chromium which blocks infiltration of corrosives to underlying metal. It is followed by another layer of Unichrome SRHS® Chromium to build up proper thickness. The additional millionths of an inch more chromium, in these two layers, do more for outdoor durability than any other change in present plating procedure. Results show that per dollar invested in equipment and solutions, this new technique gives greater benefits than a corresponding expenditure for thicker copper and nickel undercoats. It saves on capital investment because existing production equipment can be used. It saves by cutting rejects of parts which are now required to survive more rigorous life tests than heretofore.

Simply by adding the few additional minutes to plating time and using M&T "Duplex Chromium", you can add *years* to the life of chromium plated finishes in outdoor exposure. Send for data. Or ask the M&T Man about it.

METAL & THERMIT
CORPORATION
GENERAL OFFICES: RAHWAY, NEW JERSEY



The cathode ray oscilloscope is one of science's and industry's most perceptive instruments for determining uniformity of operation. The pattern reproduced here is a harmonically modulated sine wave of exact uniformity.

Uniformity is Malleable

Just as the input of an oscilloscope can be controlled to produce repetitive patterns, so can consistently uniform metal parts be produced with Malleable iron because of modern, scientific controls. The unique method by which all Malleable castings are made and the exacting techniques employed by Malleable foundries assure Malleable users of castings that are uniform, part after part, regardless of size or shape. This uniformity, combined with unparalleled physical and mechanical properties, ideally suits Malleable castings for modern America's quality products.

For information or service, call on one of the progressive firms that identify themselves with this symbol—

MEMBER

MALLEABLE

CASTINGS COUNCIL

If you wish, you may inquire direct to the Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio, for information.

Better Products at Lower Cost Result From Malleable Uniformity Controls

Uniform quality — whether for five or five million pieces — is essential to maintain product quality and increase manufacturing efficiency. With accelerating frequency, Malleable castings contribute their unique uniformity in critical applications where durable, reliable components are necessary.

Key to Uniformity is Control

Malleable iron is produced under closely controlled manufacturing techniques. From charge composition and molding sand properties, through final inspection, every critical factor is held constant by using the most modern techniques of metal analysis, process control and inspection.

Internal Uniformity

This versatile engineering material is achieved through converting the base white iron into tough Malleable iron by a controlled heat treating process. Malleable's internal structure exhibits excellent uniformity, an important factor in assuring the dependable performance of intricately designed components.

External Uniformity

Fundamental to the casting process is the ability to produce a given shape, time after time, in either small or large quantities. Metal can be placed exactly where it is needed . . . eliminated where it is not. Good design — achieved through close cooperation between the customer and the foundry — can assure the necessary tolerances and the lowest possible finished part cost. Modern techniques of production and inspection are used to insure top quality, dimensionally accurate castings.

The life of every motorist rides in complete safety on Malleable wheel hubs of unerring uniformity.

Uniformity Proven by Use

The final test of any part is how well it stands up in actual service. Under continuous cyclic and shock loading, the millions of Malleable wheel hubs, which are in service on the front end of every American-made car, have compiled an enviable record of proven uniformity. Another dramatic example of Malleable's uniformity is proved in the old adage "A chain is only as strong as its weakest link." Miles of Malleable chain, carrying tremendous loads year after year without failure, demonstrate the uniformity of every cast link.

New techniques for controlling every element of Malleable production are the result of intensive research done by Malleable foundries in their continuing search for ways to make Malleable even more versatile and indispensable to industry.

More Information Available

Your copy of *Data Unit 103—Uniformity* — is available from any member of the Malleable Castings Council. If you prefer, write direct to Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

These companies are members of the

MALLEABLE CASTINGS COUNCIL

CONNECTICUT
Connecticut Mall. Castings Co., New Haven 6
Eastern Malleable Iron Co., Naugatuck
New Haven Malleable Iron Co., New Haven 4

DELAWARE
Eastern Malleable Iron Co., Wilmington 99

ILLINOIS
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA
Link-Belt Company, Indianapolis 6
Muncie Malleable Foundry Co., Muncie
Terre Haute Mall. & Mfg. Corp., Terre Haute

MASSACHUSETTS
Belcher Malleable Iron Co., Easton

MICHIGAN
Albion Malleable Iron Co., Albion
Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw

MINNESOTA
Northern Malleable Iron Co., St. Paul 6

NEW HAMPSHIRE
Laconia Malleable Iron Co., Laconia

NEW JERSEY
Meeker Foundry Company, Newark 4

NEW YORK
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO
American Malleable Castings Co., Marion
Canton Malleable Iron Co., Canton 5
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
Maumee Malleable Castings Co., Toledo 5
National Mall. and Steel Castings Co., Cleveland 6

PENNSYLVANIA
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

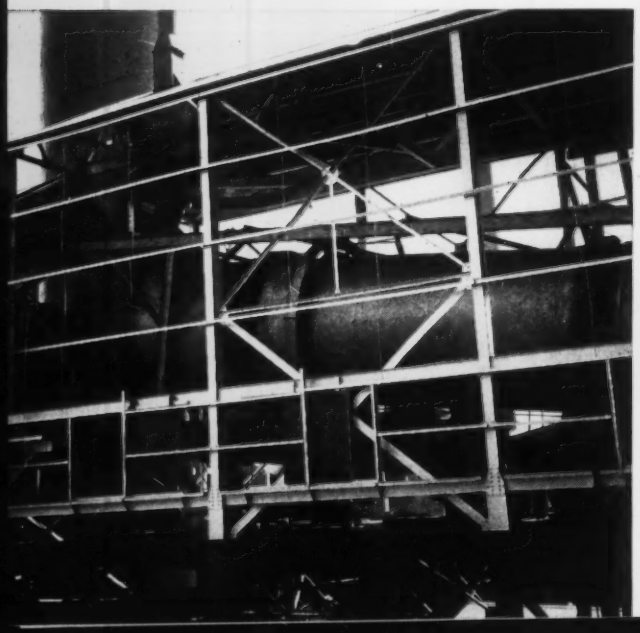
TEXAS
Texas Foundries, Inc., Lufkin

WEST VIRGINIA
West Virginia Mall. Iron Co., Point Pleasant

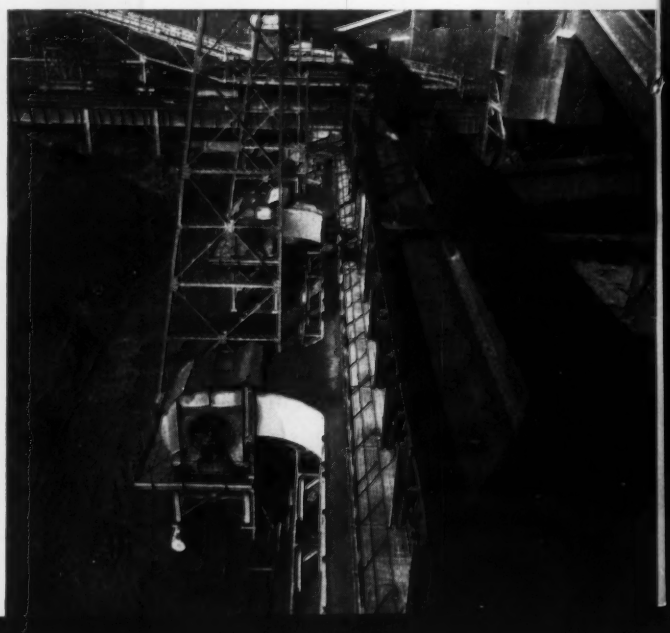
WISCONSIN
Badger Malleable & Mfg. Co., S. Milwaukee
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

GREAT LAKES

This balling drum is the biggest ever used—50 feet long and 12 feet in diameter. It has an adjustable-speed motor and the slope is controlled by shims. This superior method of preparation is delivering 600 tons of permeable sinter mix material per hour.



The straight-line, forced-draft cooler is 10 feet wide and 178½ feet long over the windboxes. It is cooling hot sinter at the rate of 480 tons per hour. A 50-hp motor drives the cooler strand at about 11 feet per minute.



STEEL SETS INDUSTRY RECORD

8,400 tons of sinter per day in new plant built by KOPPERS

Operation of the sintering plant and materials handling systems is controlled from this panel board, located at the feed end of the sintering machine. It's the largest iron ore sintering machine in the world.

It's the largest iron ore sintering machine in the world —12 feet wide and 200 feet long over 19 double windboxes. It's a giant, but operates with a very high efficiency. Total output of 8,400 tons from *one* machine in a single day is a new record for sintering.

This plant is part of the continuing expansion program at the Zug Island Works of Great Lakes Steel, a Division of National Steel Corporation. The company foresees a hot metal production increase of 20 to 30%, due largely to the sintering and ore handling facilities designed and built by Koppers Company, in cooperation with engineering and operating personnel from National Steel.

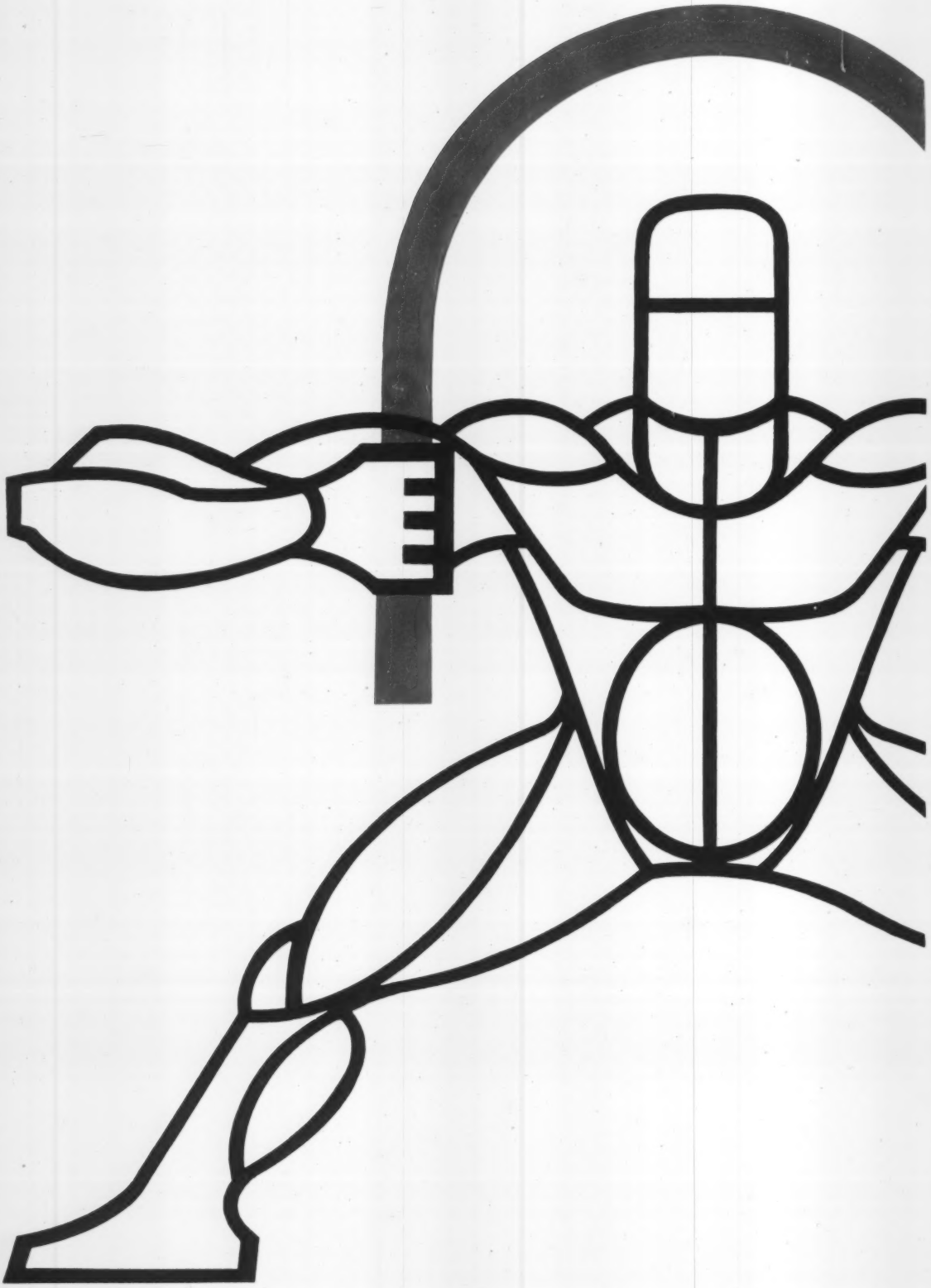
The new facilities include an ore handling system, an ore crushing and screening station, a miscellaneous materials handling system, a sintering plant, and a sinter handling system. The installation has 84 conveyors, with widths up to 48 inches and capacities to 1,250 tons per hour.

Many of the features in this installation are entirely new to commercial plant operation. You might be interested in the complete story, which is covered in an 18-page booklet, "Ore Handling and Beneficiation at Great Lakes Steel." For a free copy, please write to Koppers Company, Inc., Engineering and Construction Division, Room 1124, Pittsburgh 19, Pa.

KOPPERS®

KOPPERS

ENGINEERING AND CONSTRUCTION



NOW... SUPERIOR FORMABILITY IS AVAILABLE IN AN EXTRA-STRENGTH STEEL

N-A-XTRA

BEST LOW-ALLOY EXTRA-STRENGTH STEEL YOU CAN BUY

N-A-XTRA HIGH-STRENGTH is a heat-treated steel now available in minimum yield strengths of 80,000-110,000 psi.

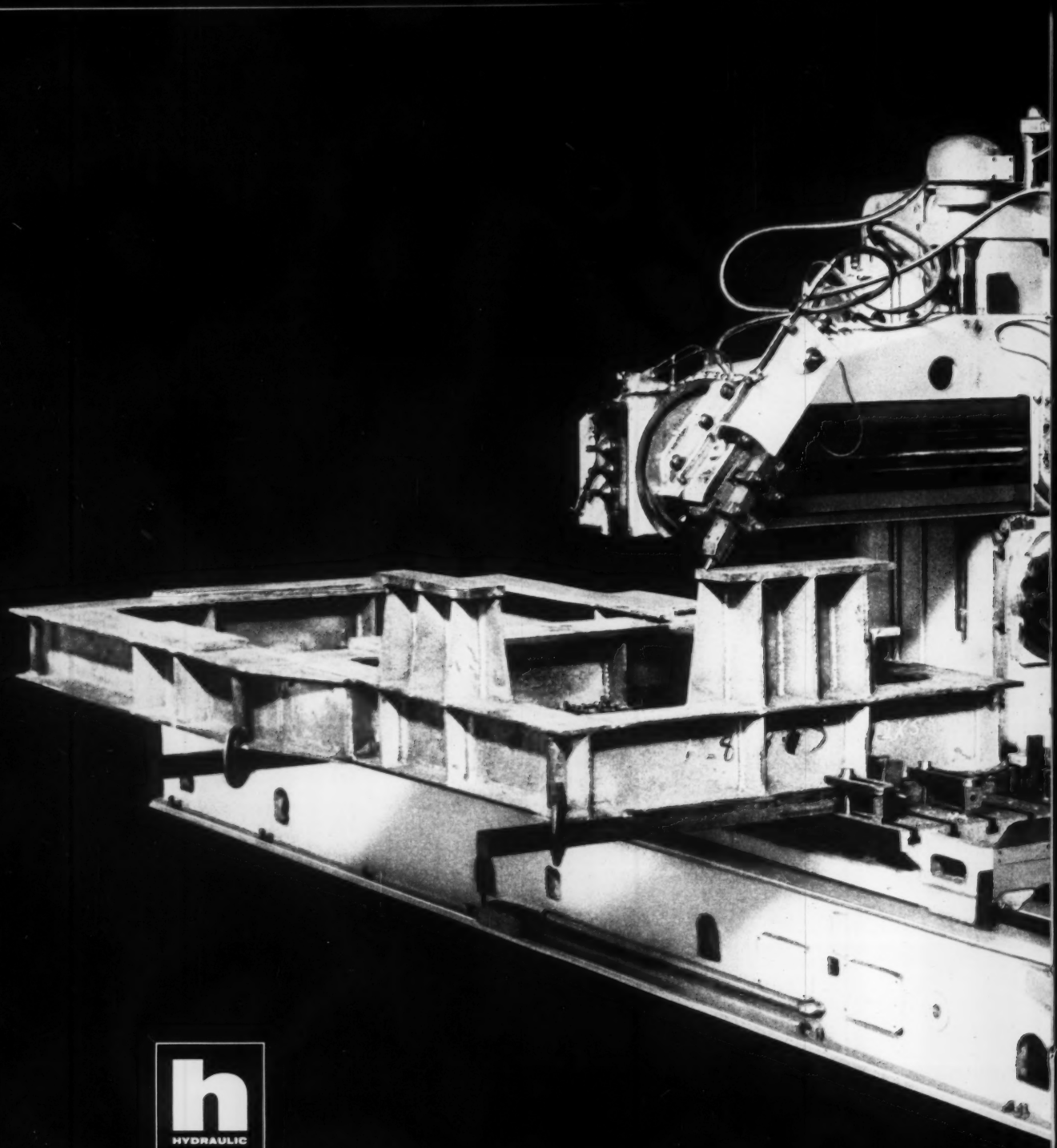
Unlike most steels of this strength and toughness, N-A-XTRA can be cold formed into difficult shapes, gas-cut, sheared, machined, and otherwise handled by conventional fabricating methods. It has superb weldability—by any process. And its great strength gives designers and engineers a unique opportunity to eliminate useless dead weight from finished products.

For complete information on N-A-XTRA—the best low-alloy extra high-strength steel you can buy—write Great Lakes Steel Corporation, Detroit 29, Michigan, Dept. B-9.

N-A-XTRA

GREAT LAKES STEEL

A DIVISION OF NATIONAL STEEL CORPORATION

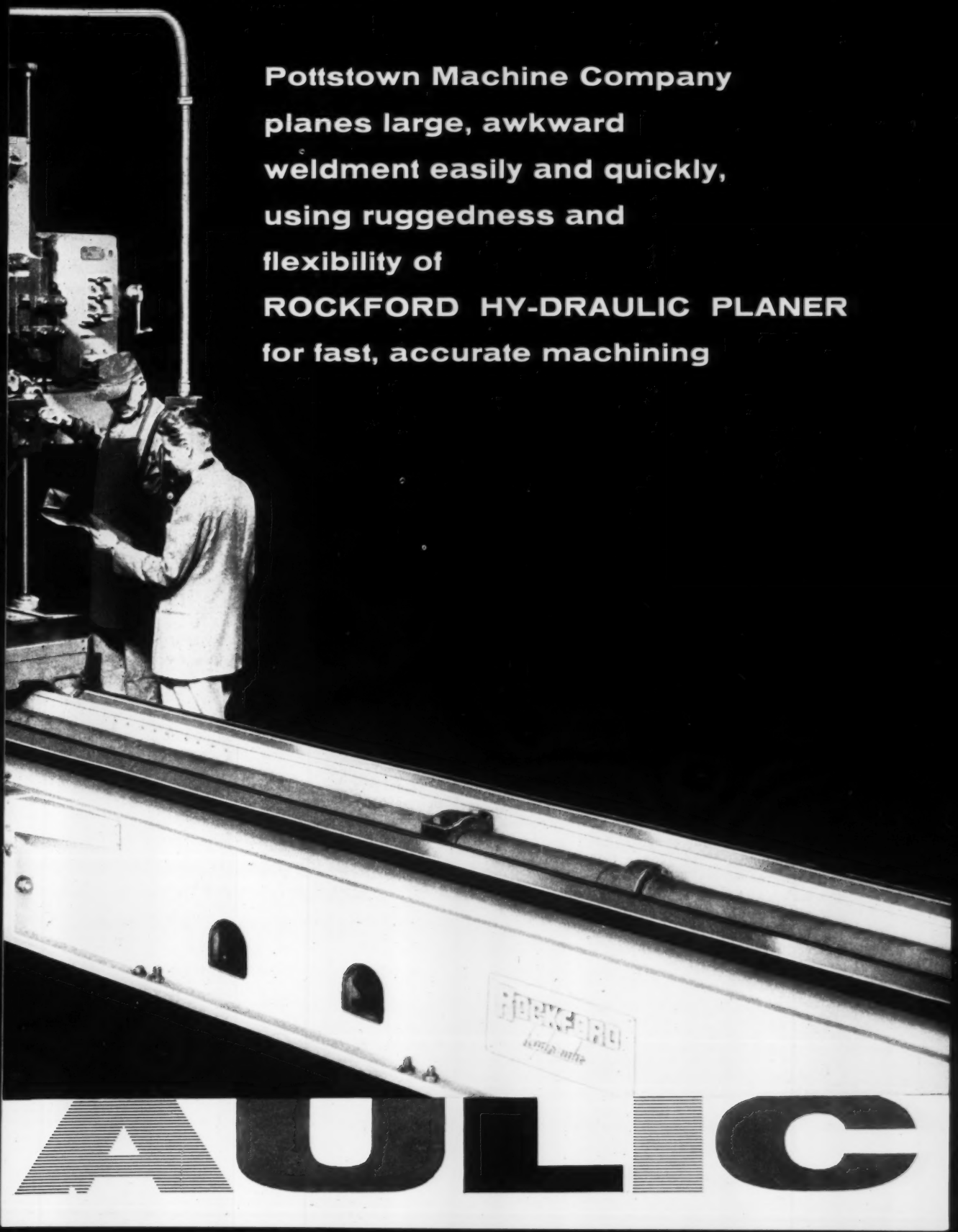


HYDRAULIC

ROCKFORD MACHINE TOOL CO. 2500 KISHWAUKEE STREET ROCKFORD, ILLINOIS

HY-DR

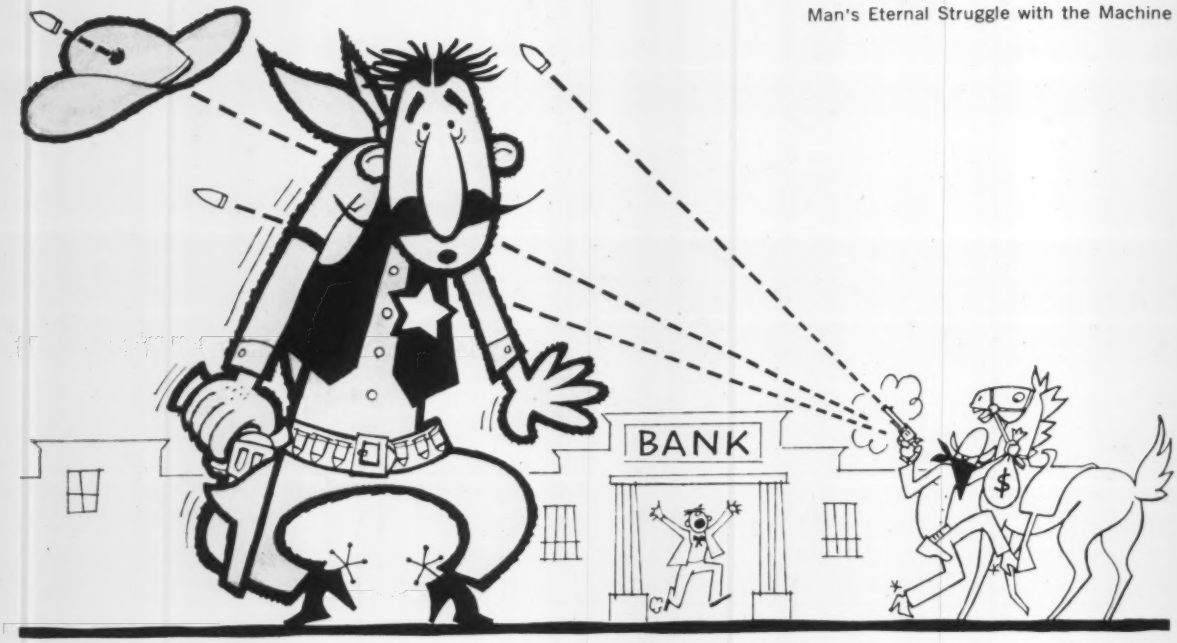
THIS HANGOVER IS NOT A HEADACHE!



Pottstown Machine Company
planes large, awkward
weldment easily and quickly,
using ruggedness and
flexibility of
ROCKFORD HY-DRAULIC PLANER
for fast, accurate machining

AULIC

Man's Eternal Struggle with the Machine



COMPETITIVE PRESSURES AND RISING COSTS DEMAND GREATER PRODUCTION EFFICIENCY THAN EVER BEFORE

Have you ever wished you worked in a nice, quiet little shop...?

Sure you have.

The chances are you don't work in one now. There just aren't any nice, quiet little shops anymore. Everybody's out to make a buck. And they all seem to be competitors of yours.

Like everybody else's, your shop is full of complex equipment. Production is rough on the best of it. Eventual breakdown of some sort is almost inevitable. Even though your maintenance people can satisfy most of the problems, what happens when something goes wrong they can't handle?

With your production held up by a breakdown, you can't afford a vendor who passes the buck for service to all the suppliers of his components!

And what about that new equipment you're going to buy? Probably the latest in design. Most likely something your service people don't know anything about at all! Yet, it's got to get into production fast, and stay in as consistently as possible. With your production waiting, you can't afford to test and prove the vendor's machine for him!

Sciaky has always accepted *full responsibility* for its resistance welding and production equipment. Sciaky equipment is designed and built to do the job it was sold to do. That's why it's tested and proved *before shipment*. That's why the Sciaky Service Organization is on call anytime to service Sciaky equipment when necessary.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you're considering equipment. No obligation, of course.

Sciaky Service is a plus-feature that has been wanted by customers all over the world. Why take a chance on service that's sometimes needed on even the best machines. Why, to be sure, when you can enjoy the service facility that has been the difference between expensive production stoppages and minor delays.

SCIAKY®

75A

SCIAKY BROS., INC., 4909 W. 67th STREET, CHICAGO 38, ILLINOIS • POrtsmouth 7-5600

These workpieces get the "Touch of Gold" in this barrel

... Because greater value is added to each product as it is finished with Norton TUMBLEX* abrasives. Let us show you how this "Touch of Gold" can save you money and perform your barrel-finishing and your polishing operations better.

Send in your parts to our Sample Processing Department. We'll finish them using the latest type of tumbling equipment . . . selecting the correct abrasive from our complete line . . . and give you a detailed report on methods and equipment.

Send your parts to NORTON COMPANY, General Offices, Worcester 6, Mass.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — **BEHR-MANNING DIVISION** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

Lincoln

WELDYNAMICS

NEWS ABOUT ARC WELDING AT WORK CUTTING COSTS

Better quality, lower cost when Lincoln mild steel wire and alloy fluxes are used on high pressure pipe.

HOW FLORI PIPE CONTROLS QUALITY AND COSTS... MEETS DELIVERY DEADLINES

Keeping quality up, costs down and still maintaining delivery of prefabricated pipe sections is a tough job for anyone. But even on such vast piping jobs as Tidewater Oil Company's Delaware refinery it is all in a day's work to the Flori Pipe Company of St. Louis, Missouri. Flori is one of the nation's leading fabricators of high pressure pipe for the petroleum and petro-chemical industry.

Flori's Welding Engineer is Ken Notvest. He is responsible not only for welding methods and procedures; but also for maintaining the high degree of welding quality required on the special alloy pipe work in which Flori specializes.

Jetweld LH-70 gives 99% X-ray acceptance.

Mr. Notvest has developed some excellent procedures for manual welds. He uses Fleetweld 5-P, a Lincoln E-6010 electrode, for root beads in carbon steel pipe and follows with Jetweld LH-70, a low hydrogen E-7018, for cover passes. This gives them 99% X-ray acceptance on open gap welds without backing rings.

After testing many different electrodes for this application Mr. Notvest believes Jetweld LH-70 to be superior for deposition rate, appearance, out-of-position welding, and as-welded low temperature impact strength.

Flori also has many automatic submerged arc welding applications in their pipe fabricating plant. They once welded alloy pipe with alloy wire and neutral flux. However, as a result of a survey conducted in the plant by John Lucas, a Lincoln welding engineer, they have found that Lincoln alloy fluxes (mixed especially for them), and mild steel wire cut material costs by two-thirds—cut welding time in half and make better welds.

Mr. Notvest claimed, "When we invited the Lincoln man to survey our operations we had no idea that the result would make such substantial savings."

For cost reduction ideas and help with procedures, call your Lincoln welding engineer today.

Ken Notvest, Flori's Welding Engineer, examines a weld from the inside with the "Bore Scope" he designed and built.

The LINCOLN ELECTRIC CO.

Dept. 1654 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

Cold Rolled Shear Lines at Pittsburgh Steel Company.

Sheet and Strip Finishing Equipment

COILING - UNCOILING

TRIMMING OR SLITTING

SHEARING - LEVELLING

PILING OR COILING

PICKLING OR CLEANING

SCRUBBING, DRYING
CONVEYING

• Aetna-Standard builds equipment for processing any conventional size or weight of sheet and strip.

The diversified line includes Side Trim and Shear Lines; Automatic Gaging and Classifying Lines; Slitting Lines; Scrubbing and Drying Lines; Coil Preparation Lines; Anneal and Pickle Lines; Shears, Coil Boxes, Up-coilers, Levellers, Pay-Off and Tension Reels; Pilers and the patented Kauffmann Sheet Classifier.

Aetna's equipment is recognized as equipment "built for 21-turn operation".

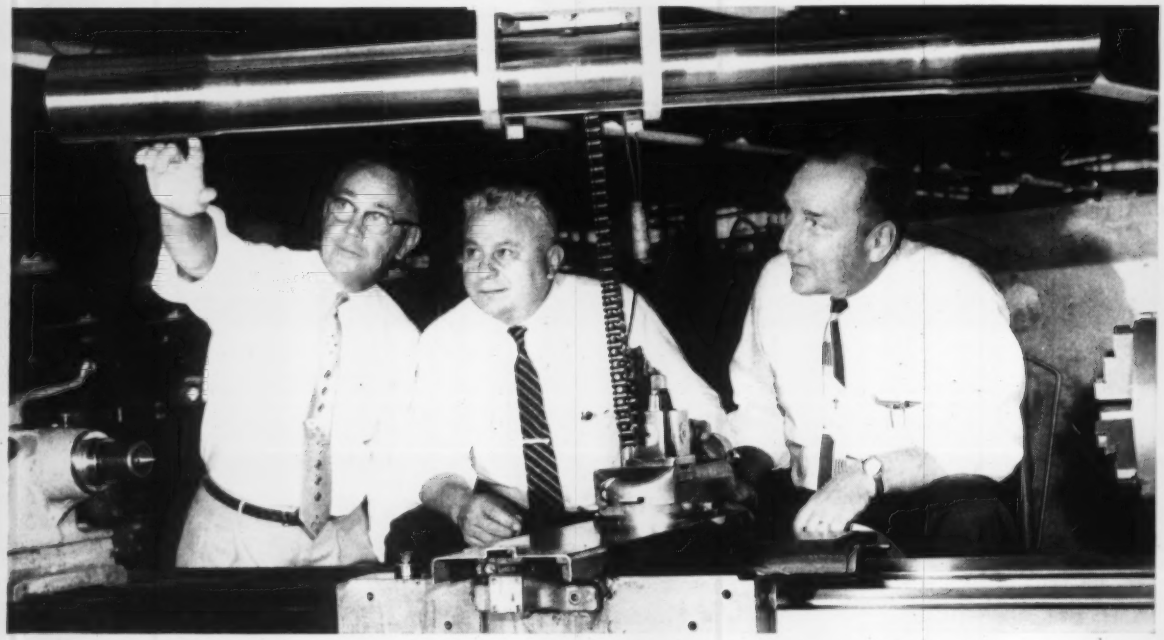
BLAW-KNOX

BLAW-KNOX COMPANY

Aetna-Standard Division
Frick Bldg., Pittsburgh, Pa.

SPS RELIABILITY / *A dynamic standard of predictable performance*

Need large precision parts?



300-lb. precision stud, meeting rigid mechanical and metallurgical specifications, exemplifies capabilities of SPS Nuclear Products Division. SPS is a major supplier of high-reliability structural components for nuclear reactors and related equipment, as well as for other types of power-producing machinery.

SPS Nuclear Products Division can meet your most exacting requirements

The SPS Nuclear Products Division offers unique facilities for handling your large-diameter precision machine work. This includes not only outsize bolts and studs, but also such items as control rod housings, coolant pump components, and large bushings—in conventional metals and in various super alloys.

Among the division's special-purpose machinery are batteries of modern tracer lathes and milling machines, some capable of swinging sections 3 ft. in diameter and 11 ft. long. There is also unusual equipment for deep hole drilling and internal grooving, including models able to produce precision holes up to 80 in. deep. Available too are SPS' extensive heat treat and plating facilities, as well as the services of the company's Navy-certified welders.

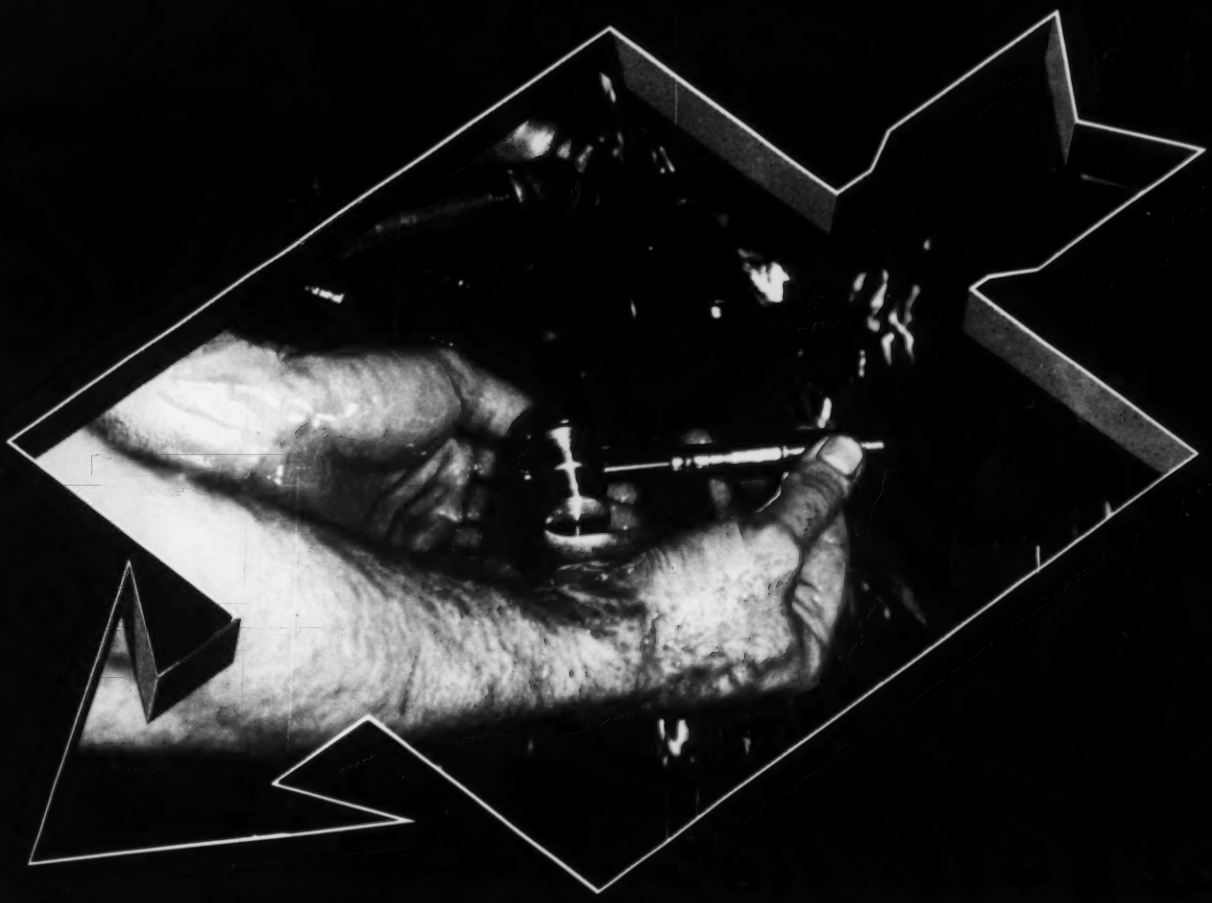
To meet the need for extreme reliability in its field, the Nuclear Products Division maintains a separate quality control staff to provide 100% inspection of its products. It also manufactures its own special gaging (unavailable commercially) to check out unusually large or complex parts. In addition, the division has access to the SPS fastener testing laboratory—largest of its kind in the U.S. —and the SPS Metrology Laboratories, recently set up to study fit problems of precision mating parts.

New Folder 2499 gives further information on this specialized service of SPS—manufacturer of precision threaded industrial fasteners and allied products in many metals, including titanium. For copies, write Nuclear Products Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

SPS **Jenkintown • Pennsylvania**

Standard Pressed Steel Co. • The Cleveland Cap Screw Co. • Columbia Steel Equipment Co. • National Machine Products Co. • Nutt-Shel Co. • SPS Western • Standco Canada Ltd. • Unbrako Socket Screw Co., Ltd.

Quality . . . the best economy of all



He does a better job when he can see what he's doing

You increase operator efficiency as well as production when you use transparent, heavy-duty Sunicut cutting oils. Operators work better, because Sunicut oils let them see tools and workpieces, see the finish, see micrometer graduations.

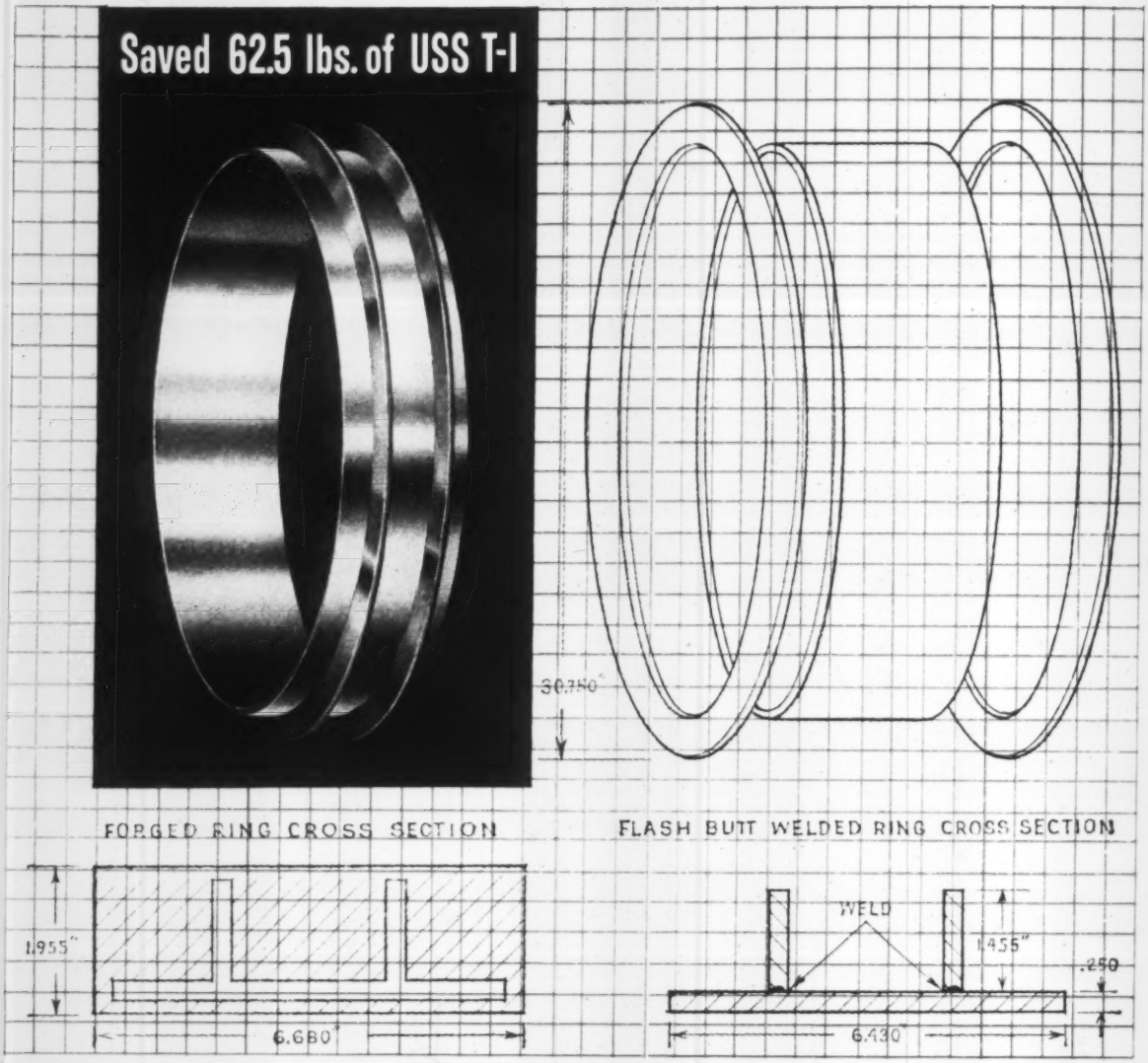
Sunicut oils don't stain hands and clothing. They pump easily, wet metal fast, and give excellent extreme-pressure lubrication.

To prove to yourself the economy of Sun quality, ask your Sun representative to help you select the right grade of Sunicut for your heavy-duty cutting requirements. Or write to SUN OIL COMPANY, Dept. I-13, Philadelphia 3, Pa.

•

In Canada: Sun Oil Company Limited, Toronto and Montreal.

MAKERS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES



Flash Butt-Welded Rings Instead of a Forged Part SLASHED $50.43 on Sway Brace Ring

By circumferentially welding two flash butt-welded rings around a flash butt-welded band, Amweld engineers eliminated a bulky forged ring and hours of machining. The finished part, a sway brace ring for a jet engine, met manufacturer's critical requirements for aircraft use.

Savings like these have been effected on a wide variety of aircraft and missile parts, particularly where high-strength, high-temperature alloys were involved.

Amweld's 41 years of fabricating experience are backed by extensive welding, forming and machining facilities. We will be happy to study your problem and to handle subcontract work on either prototype work or production orders.

GET THE FACTS ABOUT AMERICAN WELDING

Complete information. Facilities brochure, Precision Assemblies Catalog, and booklet on "How Flash Butt-Welded Rings are Made."

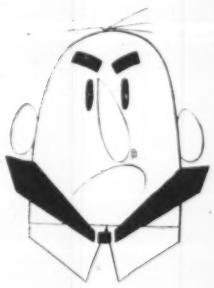
THE AMERICAN WELDING & MFG. CO. • 110 DIETZ ROAD • WARREN, OHIO

AMERICAN WELDING

Metalworking Outlook

June 29, 1959

Metalworking Managers Expect Better Second Half



This little fellow's bow tie points the direction of metalworking's sales and profits for the second half. Sales will increase 5 per cent; profits will climb 6.2 per cent, a STEEL survey of 6000 plant managers discovers. But the frown on our hero's face indicates other findings of the survey. Manufacturing costs are expected to rise 2.8 per cent, while selling prices advance only 1.5 per cent. And metalmen face many serious problems—price fighting, inflation, foreign competition, wage pressures (Page 45).

Associations Paint Glowing Picture

Here's the outlook for nine industries, reported by members of the American Society of Association Executives: **Steel**—Warehouses will ship 40 per cent more steel in '59's first half than in the like 1958 period. **Homebuilding**—In a survey of 800 builders, three out of four expect 1959's second half to be as good or better than the first. **Transportation**—"The over-all picture is good." **Gas Utilities**—The industry is enjoying record annual sales of nearly $4.6 billion—up 10.5 per cent from '58—and may top out the year at $4.8 billion. **Instruments**—Look for higher sales, but expect a shortage of trained personnel and increasing foreign competition. **Electrical Goods**—1959 sales will be about $21 billion—7 per cent above last year's. **Retailing**—Inventories are rising steadily and sales are 10 per cent better than they were a year ago. **Wholesaling**—Sales climbed 545 per cent from 1939 to 1959; expect continued steady annual growth. **Consumer Finance**—Consumer income is at an all-time high—about $372 billion annually with more gains coming.

U. S. to Sit in If USW Strikes

Federal Mediator Joseph F. Finnegan (picture) will be the keyman in U. S. tactics if the United Steelworkers strike. The government plans no official action except quiet offers of mediation if the union walks out (Pages 50, 51). If no early agreement appeared likely, the President would exert his influence behind the scenes for a settlement, as he did in 1956. He has said repeatedly: "I don't want to get into the negotiations." And he means it.

Ohio Area Plans Flood Control Project

Keep your eye on a plan proposed in Cleveland for a flood control program. Initial step is a $70,000 survey to determine the feasibility of establishing

industrial sites in a seven county region. If the project is successful (it has some influential backers), it may establish a pattern for other water-troubled areas in the nation.

Washington Will Act on Steel Controls If Strike Is Long

U. S. officials have blueprinted what they'll do about steel distribution in case of a long walkout (Page 56). They see no call for drastic action unless the strike goes beyond 30 days. Then they're likely to take a leaf from their action in 1956 when they limited the amount of aircraft and other special steels nondefense users could get each week from warehouses.

Whitecollar Workers Get More Pay, Snub Unions

The average weekly salary for clerical employees in the U. S. is $70—$6 more than a year ago, the National Office Management Association discovered in its latest annual survey of 7500 firms. NOMA also found: 1. Whitecollar people belong to unions in only 7.8 per cent of the firms—a decrease from last year. 2. The ratio of total workers to officeworkers is 3.06 to 1. 3. More companies are granting a seventh and eighth paid holiday. 4. The most common workweek is still 40 hours. 5. Overtime is paid after 40 hours by 72 per cent of the companies.

An Aluminum Army May Be Coming

The aluminum industry is looking to the U. S. Army as a consumer to replace the dwindling aircraft market. (Missile tonnages are far smaller than those that once went into aircraft.) Aluminum people visualize flying tanks, floating personnel carriers, mobile missiles (Page 52). The Navy uses the light metal in its glamorous ground skimming devices and flying "jeeps."

And All-Aluminum Houses Too?

Look for aluminum to replace wood, paper, plaster, cloth, and some other metals in the home of the future. Samuel L. Fahnestock, chief industrial designer for Aluminum Co. of America, foresees the light metal's use in wallpaper, nursery furniture, cabanas and summer houses in do-it-yourself kit form, decorative screens, room dividers, enclosures for speakers and hi-fi components, table tops, large appliances, dressers, sideboards, cabinets, bathroom furniture, and rugs that would supply heat when connected to an appropriate energy source. He also looks for homes to be built of aluminum panel sandwiches with interior walls of aluminum—plain or textured—finished by anodizing, porcelain enameling, lacquering, or laminating wood, vinyl, or cloth to the light metal.

Chrysler's Valiant to Have Aluminum Engine?

Chrysler may use an aluminum six-cylinder engine in its coming small car, the Valiant. Chrysler Corp. of Canada is joining Aluminum Co. of Canada to form Chryslum Ltd., which will supply aluminum ingots to Chrysler plants in the U. S. and Canada.

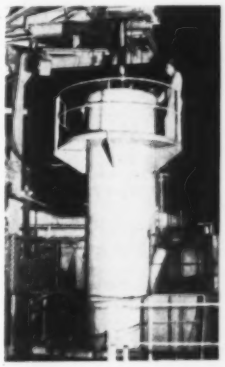
How Better Lighting Can Brighten Your Profit Picture

You can lift worker efficiency, slash reject volume, greatly improve safety and housekeeping through good industrial lighting. Gains in productivity of 5 per cent and more are attributed to new or upgraded systems (Page 54). And alert managers are taking advantage of new products and designs. The young lady (see picture) compares General Electric's new "Quartzline" lamp with an older GE bulb. The new lamp is 200 times smaller but will give 10 per cent more light during its life. A revolutionary iodine principle allows the lamp to clean itself.

Economic Barometers Signal Good Summer Sales

Net new orders for machine tools in May totaled $48.1 million—about double the figure for the year-earlier month . . . Nonfarm housing starts in May were 24 per cent above the year-earlier rate and represented a seasonally adjusted annual rate of 1,340,000 . . . The number of new business incorporations in May (16,660) was the highest for any May on record, reports Dun & Bradstreet . . . 1959 sales of magnesium will be 25 to 30 per cent higher than 1958's, estimates Business & Defense Services Administration.

Steel Keeps Pace in Space Race



Look for better steels for military and civilian uses. Several promising processes are being studied at U. S. Steel Corp.'s Applied Research Laboratory, South Works, Chicago. Examples: 1. A scale model open hearth that heats water instead of melting steel, allowing accurate combustion studies to be made. 2. A multiple vacuum casting unit that permits up to seven ingots to be poured from one heat of steel. 3. The Nu-Iron process, a method of reducing iron ore to iron without using metallurgical coke.

Retired Execs Never Die; They Become Consultants

You don't have to lose the experience and judgment of retiring executives. About half of 278 manufacturers surveyed by National Industrial Conference Board retain retired executives as consultants. Arrangements differ widely. Some firms use their services only occasionally and informally; others

put them on special project work. More frequently, though, companies have formal agreements with the retired men. The pacts usually run for three to ten years and stipulate a retainer fee. One in four companies gives the retiree office space and stenographic help. One in eight permits retired brass to serve on committees.

Bethlehem Changes Executive Pay Plans

Bethlehem Steel Corp. shareholders will vote next month on a plan to reduce the pay of top executives and change the company's incentive plan. The immediate effect will be to cut the total compensation of the firm's 20 top officers by $1.2 million during the second half. The new plan would eliminate cash compensation based on a percentage of the dividends paid on common stock. (Last year, executives got $4.8 million in incentive compensation.) It would substitute a plan based on "dividend units." Effective July 1, annual salaries of the top men will be reduced to about 60 per cent of the total remuneration received in 1958—if shareholders agree. However, they'll gain tax advantages under the new system.

Molybdenum Markets Expand

Wrought molybdenum products are moving out of the rare metal classification. Missilemakers have become big users. Moly also goes into heat exchangers, cathodes, furnace parts, and items for the glass industry. More than 600,000 lb of the metal will probably be sold this year. Climax Molybdenum and Universal Cyclops Steel's Refractomet Div. are the biggest producers. Moly's unusual properties and improved availability may make it the answer to some problem jobs you have (Page 110).

Ultrasonics Weds Steel to Beget Better Castings

Westinghouse has taken a giant forward step in the art of grain refinement in steel castings. Long attempted by other firms and reported successful by Russian sources (STEEL, Feb. 9, p. 79), Westinghouse scored its breakthrough by applying ultrasonics to the consumable electrode, vacuum arc furnace. The key is a transducer in the bottom of the crucible which shakes big crystals of metal into little ones as they form during cooling. Results: Cleaner, stronger, more easily worked steels. Westinghouse hopes to apply the method to large ingots, has only achieved results on small sizes so far.

Straws in the Wind

Look for Curtiss-Wright Corp. to unveil a new type automatic transmission for automobiles within 90 days . . . The Senate approved a three year extension of the defense contracts renegotiation law . . . Expect bituminous coal prices to rise about 50 cents a ton soon. Expect spending for the civilian space program to hit $3 billion annually by 1962 . . . The U. S. will have a 2500 ton moonship, with more push than 16 Atlas ICBMs, ready in about seven years.

STEEL

more types and tonnage in stock at RYERSON than anywhere else

In spite of heavy demand, we are currently able to meet most steel requirements. And in a period such as this, as always you can count on Ryerson to maintain its regular policy of fair prices and to furnish steel that is always of high, uniform quality.

As this is written, we can only hope that mill production will not be halted by a strike. But if a strike does develop, we are confident that our large and diversified stocks will enable us to serve more of our customers better—and for a longer time—than in any comparable period in the past.

STEELS IN STOCK

CARBON STEEL BARS—Hot rolled and cold finished—round, square, hexagon, flat, etc.

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Forming and welding, flange and firebox qualities, high carbon, E-Z-Cut, etc.

SHEETS & STRIP—More than 20 types

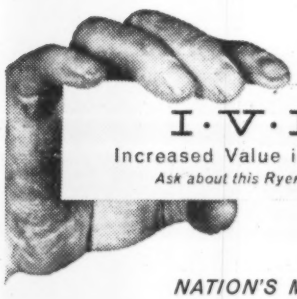
TUBING—Seamless and welded mechanical, hydraulic cylinder and fluid line, structural, etc.

STAINLESS STEEL—Sheets, plates, bars, tubing, pipe and fittings. 15 types, standard and aircraft qualities.

ALLOY STEEL—Case hardening, direct hardening and heat treated, Rycut leaded alloys, aircraft quality alloys, etc.

CONSTRUCTION STEELS—Re-bars, spirals, wire fabric, post-tensioning open web joists, etc.

TOOL STEEL—Water and oil hardening.



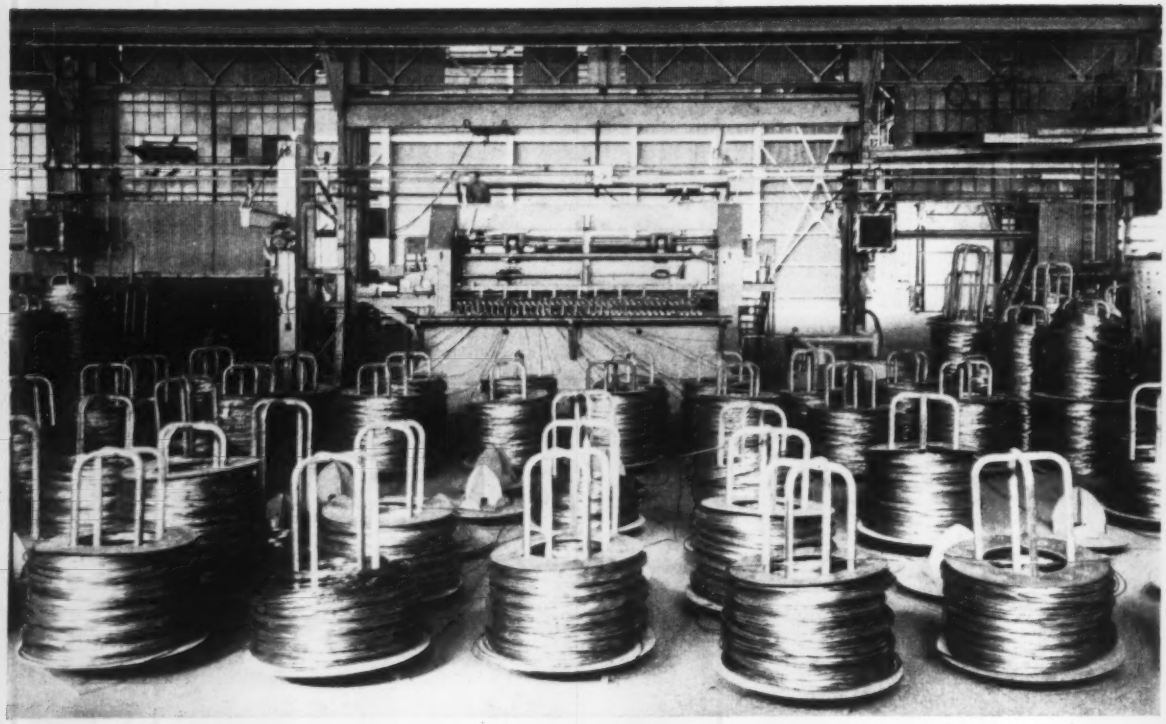
I·V·B·M
Increased Value in Buying Metals
Ask about this Ryerson Plan for 1959

RYERSON CERTIFIED QUALITY

RYERSON STEEL®
Member of the INLAND Steel Family

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

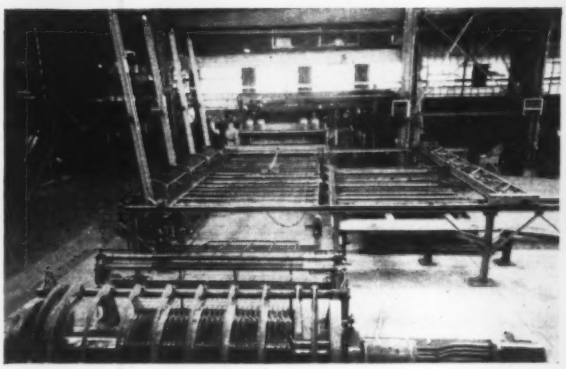


Let DSC LPR COILS help cut your brite wire fabricating costs as they have done for our Portsmouth Division on Welded Wire Fabric

Look closely at the entry side of this giant Welded Wire Fabric machine. This one produces mesh in widths up to 13', used for reinforcing concrete in road, pipe and other construction. Fed by as many as 80 - 3,000 pound Brite Wire LPR's running simultaneously off as many reels, it produces rolls from 300' to 500' long, weighing up to about 6,000 pounds. The flat mats or sheets run up to 30' long.

In the photograph at the right, you see the delivery side of the welder, shear in the background, coiler in front and, in between, the fully automatic "flipper" and piler . . . the only one of its kind, we are told.

Our original purpose in developing continuous-length, long-production-run LPR's was to improve the efficiency of our own mesh operations. Compared with regular mill coils weighing about 300 pounds which we used previously, our 3,000 pound LPR's reduced downtime frequency by 90% and attendant coil-change and other costs proportionately. *Would our experience be helpful to you?*



FOR PRACTICAL POINTERS on wireworking generally, or for complete information on LPR's or Fabric, or DSC wire and flat rolled products — call your nearest DSC Customer "Rep" office . . . or write us at Detroit 9.

Customer Satisfaction — Our No. 1 Job

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

Customer "REP" Offices in Principal Cities

*A DSC TRADE-MARK

The PROOF of DSC STEEL is in its PERFORMANCE on YOUR Job

DSC PRODUCTS: Coke....Coal Chemicals....Pig Iron Basic Open Hearth Steel Ingots, Blooms, Slabs, Billets, Rods HR and CR Sheet and Strip.....Flat CR Spring Steel Mfrs.' and H. C. Specialty Wire.....Welded Wire Fabric

COPYRIGHT DETROIT STEEL CORPORATION 1959

Price Cutting Is Suicide!

In 1959, the metalworking industry will have its second best year. Sales of $132 billion (see midyear forecast, Page 45) will exceed 1958's by $12.5 billion and come within $8.5 billion of matching the record of $140.5 billion in 1957.

Yet for many companies the ring of this apparent prosperity will sound pretty hollow.

Some industrial products and consumer hard goods are being sold at prices so ridiculous they often return little more than the direct cost of labor.

The situation will get no better in the second half when management expects to recover only a fraction of increased production costs in the form of firmer prices.

The blame is double pronged:

- On the seller who, in his anxiety to land an order, cuts prices without regard to costs, or without really knowing what they are.
- On the buyer, who, in his zeal to squeeze the last nickel out of the price he pays, plays one supplier against the other.

Both seller and buyer forget that pricing has functions that go far beyond simply marketing a product. They include recovering all costs, making a reasonable return on invested capital, and providing the funds for the new plant and equipment needed to keep pace with advancing technology.

They forget, too, that there is more to marketing than price alone. Customers expect improvements in product quality and design, good performance, attractive packaging, and reliable service.

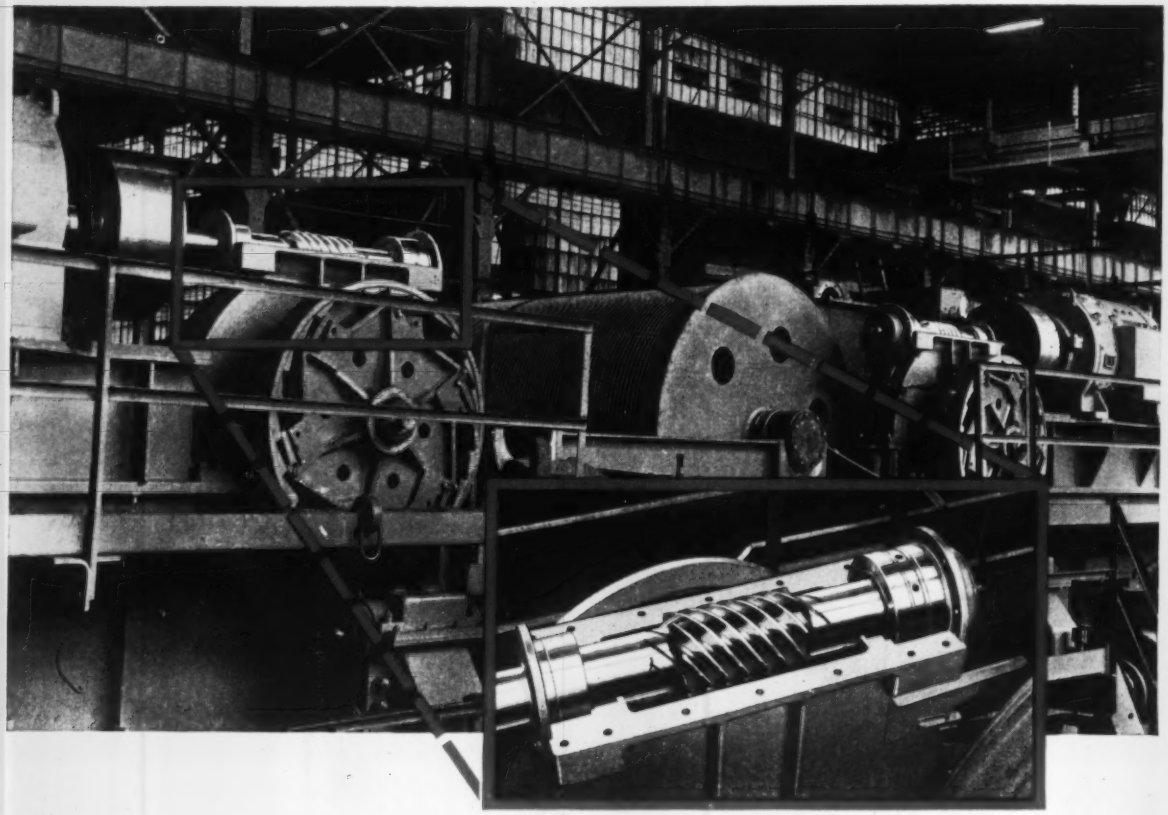
Because of the growing complexities in marketing, major pricing decisions no longer should be left to the judgment of people who are not fully conversant with all the factors involved.

Management needs to establish pricing policies that are reasonable and clearly understood.

As the alternative, price cutting is the certain road toward financial suicide!

Irwin H. Such

EDITOR-IN-CHIEF



for built-in OEM drives, Cleveland custom components save space, give smoother operation

By using standardized or custom-built Cleveland Worms & Gears, machine designers overcome the frequently troublesome problem of economically providing a quiet and efficient drive in a limited space. Cleveland components are available not only in standard sets but also in special sizes and ratios. Our wide range of special worm gear production equipment places us in an unparalleled position to furnish worms and gears of special designs. We maintain a complete and perpetual master worm and hob inventory that enables ready duplication of *any* Cleveland worm and gear ever made.

Our engineering specialists will gladly give you complete information on any application where specialized worm gear know-how is required. Call them today—they're as near as your phone. Or write for Catalog 201F—it gives complete data on built-in Cleveland Worms and Gears.

CLEVELAND
Worm Gear
Drives

The Cleveland Worm & Gear Company
3270 East 80th St., Cleveland 4, Ohio

A subsidiary of
Eaton Manufacturing Company

Affiliate: The Farval Corporation

Metalworking Managers Expect . . .

Sales Volume to Rise 5% in Second Half

LAST HALF vs. FIRST HALF, 1959:

56.5% Expect Increase
30.9% Expect No Change
12.6% Expect Decrease

And Dollar Volume for Year Will Be 10.8% Above Last Year's

79.4% Foresee Increase
11.9% Foresee No Change
8.7% Foresee Decrease

METALWORKING will have near-record sales and earnings in the second half—barring an extended steel strike. The industry will approach records for the year. Employment will rise; costs will advance; selling prices will inch up; capacity will be lifted.

Those are the predictions of metalworking managers participating in STEEL's midyear survey of business expectations. The editors queried 6000 general managers of metalworking plants. Their combined beliefs signal a $132 billion sales year for metalworking—ranking 1959 as the third best year in history. That's only $8.5 billion short of a record; metalworking sold $140.5 billion worth of its products in 1957. The 1958 mark: $119.5 billion.

DOLLAR VOLUME INCREASES
Analysis by Industries

	Last Half 1959 vs. First Half	Year 1959 vs. Year 1958
S.I.C. 33—Primary metals	2.1%	17.1%
S.I.C. 34—Fabricated metal products	5.5%	8.4%
S.I.C. 35—Machinery (except electrical)	4.5%	11.4%
S.I.C. 36—Electrical machinery	6.7%	9.9%
S.I.C. 37—Transportation equipment	3.8%	11.4%
S.I.C. 38—Instruments, related products	8.4%	10.9%
Other metalworking groups*	6.9%	8.5%

*S.I.C. 19, 25, and 39.

• **But Managers Are Uneasy** — They're facing record problems too—in both number and severity. Most imminent: A walkout in steel. Producers can't hope to equal their first half performances if they're forced to close down for an extended period.

Steel users temper their optimism too. This comment from an eastern fabricator is typical: "Our second half predictions would have to be revised downward if there's a steel strike lasting a month or more." Few steel users would suffer major production losses during a four week strike; a six week walkout would hurt many; an eight week stoppage would force mass shutdowns.

• **Price Fighting Worries Many**—

Ranked as the No. 1 problem by the managers (Page 48), price competition is holding profits down. Few industries are unscathed. Lack of knowledge about the real costs of making a product is the main cause. The managers also blame overcapacity, diversification (some firms try to buy their way into markets), low quality competitive products, and overestimating savings in large volume sales. Here are some typical comments:

"In February, a competitor lowered his prices to 70 per cent of last year's level"—Maker of bleaching equipment.

"Most ferrous foundries are operating under 65 per cent of capacity and bidding on jobs at their break-even points" — Western foundry.

"Improved production methods give us more output per labor dollar, but the gain is used up in price competition"—Producer of cutting tools.

"Fifty per cent or more is a common reduction in prices quoted on special machinework" — New York machine shop.

"Overcapacity in our industry is resulting in fierce price fighting"—Large appliance producer.

"Price cutting is terrific!"—Tool and die shop.

• **Foreign Competition Tougher** — While it ranks sixth among metalworking's problems in total mentions, 1 in 10 managers says foreign competition is his No. 1 problem. Another 10 per cent called it Problem No. 2. Most predicted it will get worse. Few want restrictive quotas or high tariffs. Most believe the best solution is to hold the line on wages. Others say they can overcome lower foreign prices through higher quality and better service and deliveries. But a good many managers report that foreign technology is equaling—sometimes exceeding—that of U. S. producers in some product lines. More industries will feel the effects of imports in the coming six months than ever before. Examples:

"Foreign competition and domestic price cutting forced us to stop making cameras"—Eastern firm.

"Belgian and German steelmakers are underselling us by 30 per cent"—Midwest steel producer.

"Imports are taking away nearly 45 per cent of our business"—Fastener maker.

"Foreign competition threatens to take between 50 and 75 per cent of our business"—East coast metal fabricator.

"Our labor unions are giving our customers to foreign competition" —Chainmaker.

• **Other Pressing Problems** — The managers cite tax reform, pressure for wage increases, and inflation as the other major problems facing them. State taxes come in for some hot words:

"We may expand in a location where the tax climate is more favorable"—Ohio machinery maker.

"Spiraling taxes are causing us to relocate in the South"—Michigan manufacturer.

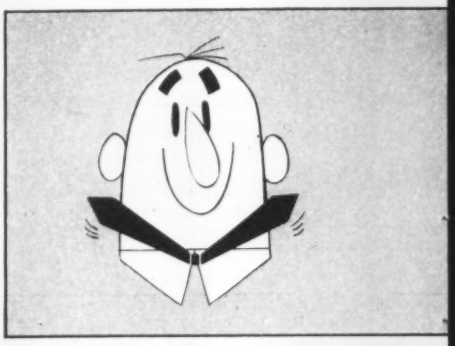
"We're discouraged by our state government's inefficiency. It costs us $8 to keep records and send a 42 cent return"—Electrical machinery producer.

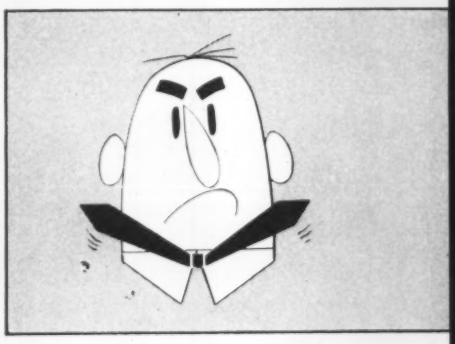
An increasing number of companies are demanding reform of the nation's depreciation policies. Witness these comments:

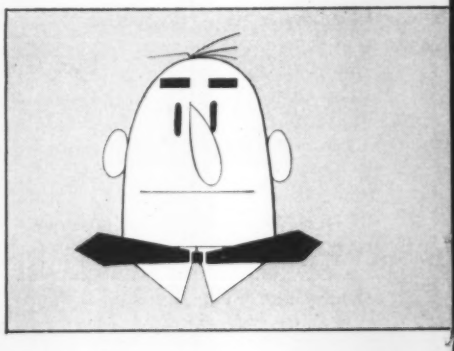
"Depreciation schedules must be changed to give an incentive to invest in small businesses; we're already using outmoded machinery" —Great Lakes area valvemaker.

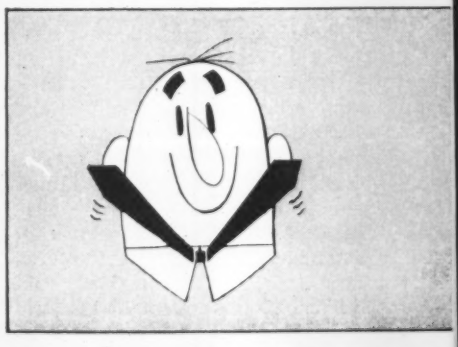
"More reasonable depreciation policies would allow us to invest in more efficient equipment and enable us to offset the constant pressure for wage increases"—Producer of wire rope.

• **Skilled Labor Outlook** — You'll have as much trouble getting skilled workers in coming months as you did in mid-1957, the managers believe. More than 1 in 10 expects output to be curtailed by a skilled



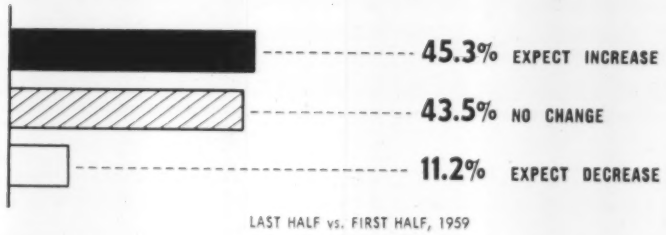






• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Employment Will Rise 2.6% in Last Half of '59

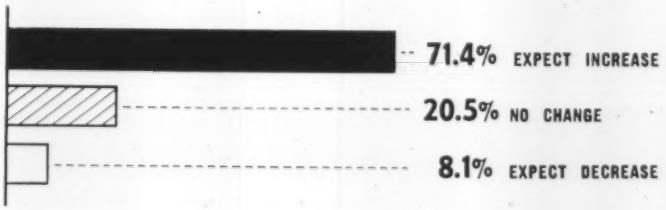


LAST HALF vs. FIRST HALF, 1959

ANALYSIS BY INDUSTRIES	Increase Expected
S.I.C. 33—Primary metals	1.4%
S.I.C. 34—Fabricated metal products	2.3%
S.I.C. 35—Machinery (except electrical)	2.3%
S.I.C. 36—Electrical machinery	3.8%
S.I.C. 37—Transportation equipment	2.1%
S.I.C. 38—Instruments, related products	4.2%
Other metalworking groups*	4.2%

*S.I.C. 19, 25, and 39.

Unit Cost of Manufacturing Will Climb 2.8%

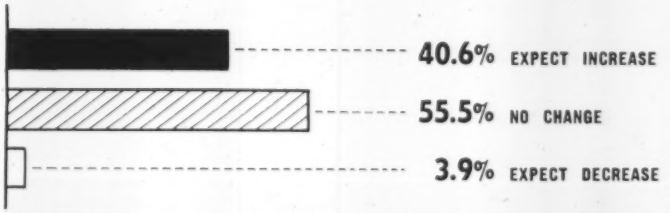


LAST HALF vs. FIRST HALF, 1959

ANALYSIS BY INDUSTRIES	Increase Expected
S.I.C. 33—Primary metals	2.5%
S.I.C. 34—Fabricated metal products	2.8%
S.I.C. 35—Machinery (except electrical)	3.2%
S.I.C. 36—Electrical machinery	2.7%
S.I.C. 37—Transportation equipment	2.6%
S.I.C. 38—Instruments, related products	1.4%
Other metalworking groups*	2.7%

*S.I.C. 19, 25, and 39.

Selling Prices Will Inch Up 1.5%

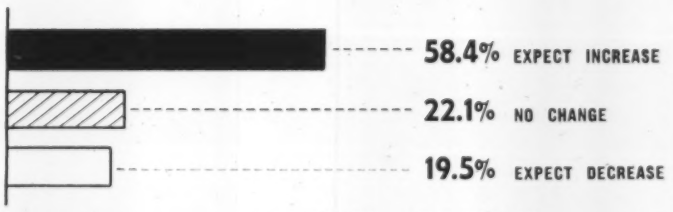


LAST HALF vs. FIRST HALF, 1959

ANALYSIS BY INDUSTRIES	Increase Expected
S.I.C. 33—Primary metals	1.9%
S.I.C. 34—Fabricated metal products	1.4%
S.I.C. 35—Machinery (except electrical)	1.8%
S.I.C. 36—Electrical machinery	1.2%
S.I.C. 37—Transportation equipment	1.2%
S.I.C. 38—Instruments, related products	0.9%
Other metalworking groups*	1.2%

*S.I.C. 19, 25, and 39.

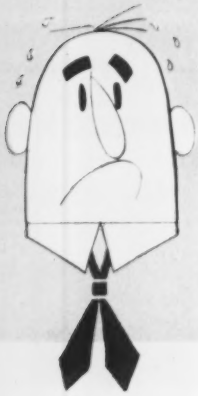
Net Profits Will Advance 6.2%



LAST HALF, 1959, vs. LAST HALF, 1958

ANALYSIS BY INDUSTRIES	Increase Expected
S.I.C. 33—Primary metals	8.0%
S.I.C. 34—Fabricated metal products	3.4%
S.I.C. 35—Machinery (except electrical)	7.6%
S.I.C. 36—Electrical machinery	7.4%
S.I.C. 37—Transportation equipment	4.6%
S.I.C. 38—Instruments, related products	10.4%
Other metalworking groups*	6.0%

*S.I.C. 19, 25, and 39.



How Managers Rank Six Major Problems

1st—Price Competition!

2nd—Pressure for wage increases!

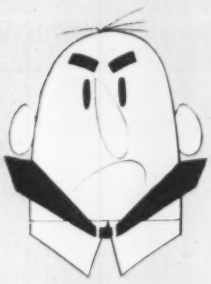
3rd—Inflation!

4th—Tax reform!

5th—Depreciation reform!

6th—Foreign competition!

TWO IN THREE managers list **price competition** as No. 1; another 16 per cent call it No. 2. One in ten says **pressure for wage increases** is the No. 1 problem; one in three calls it No. 2. One in 11 lists **foreign competition** as No. 1; 10 per cent call it No. 2. One in ten lists **inadequate depreciation allowances** as No. 3; two in ten say it's No. 4; one in three calls it No. 5. Two in ten believe **inflation** is problem No. 2; three in ten say it's No. 3.



Unit Wage Costs Will Climb Higher

70.3% Expect Increase

3.8% Expect Decrease

25.9% Expect No Change

WHY UNIT WAGE COSTS WILL CHANGE:

More overtime	18.8%
Higher rates	56.9%
Lower productivity	4.1%
Less overtime	4.1%
Lower rates	0.2%
Higher productivity	7.3%

Percentages will add to more than 100 because some managers listed more than one factor.

SKILLED WORKER OUTLOOK:

11% Expect shortage to curtail output.

Production Capacity Will Be Hiked 2.7%

33% of Plants Will Expand

Of those:

71% Will Buy Equipment

12.8% Will Build Plants

34.6% Will Build Additions

INCREASE IN CAPACITY
Analysis by Industries

Primary metals	3.9%
Fabricated metal products	2.1%
Machinery (except electrical)	2.3%
Electrical machinery	2.3%
Transportation equipment	3.6%
Instruments, related products	5.1%
Other metalworking groups	3.0%

worker shortage. A Chicago manufacturer, who says lack of skilled workers is his most pressing problem, reports that he is revamping operating procedures. Purpose: Have all skilled workers spending 100 per cent of their time on jobs demanding their maximum capabilities.

• **Small Firms Optimistic** — Managers of smaller plants look for larger sales gains than do the big plant managers. The breakdown: Plants employing 20 to 99 look for a 5.4 per cent increase in dollar volume of sales in the second half. Plants employing 100 to 499 foresee a 4.8 per cent gain (vs. 3.7 per cent for plants employing 500 or more).

The smaller plants also expect to raise prices more (1.6 per cent for plants employing 20 to 99 vs. 1.4 per cent for those employing 500 or more): And the small plants expect to expand their work forces 2.6 per cent vs. 2 per cent for the larger ones.

• **The Profit Outlook** — Smaller firms don't look for profit gains commensurate with those expected by larger companies. But all categories expect a rosier half. Most small plant managers expect their profits to rise 5 to 6 per cent. The average manager of a plant employing 500 or more expects a 9.1 per cent profit improvement.

• **Who'll Boost Prices?**—Only 4 in 10 plants plan to hike their prices in the second half. It means you'll pay about 1.5 per cent more for materials and components in the second half. Primary metal producers look for a 1.9 per cent increase—the largest one reported (Page 47). Instrument makers say they'll hike prices only 0.9 per cent. Only 1 in 3 plants in that category will boost quotations.

You'll pay 1.8 per cent more, on the average, for nonelectrical machinery this half than you did last half. You'll pay 1.2 per cent more for electrical machinery.

Electric Firms Deny Collusion

Watch for a major hassle in the electrical equipment industry. Senator Kefauver is charging price collusion; the companies deny it. They charge that the government is jeopardizing national security by importing big power generating units; OCDM denies that. TVA asks for rebids on big contracts while foreign competition grows

CHARGES of price collusion in the electrical equipment industry were heard from Washington, D. C., to the Tennessee River last week. Sen. Estes Kefauver (D., Tenn.) says his Senate Antitrust & Monopoly Subcommittee will hold hearings in August on "identical bidding by many U. S. firms" on equipment and materials for the Tennessee Valley Authority.

General Electric, Allis-Chalmers, and Pennsylvania Transformer reportedly submitted like bids for transformers, cable, and circuit breakers. STEEL was informed that another six firms submitted identical bids for a cable contract.

The companies told STEEL that they see nothing unusual about that. Listen to J. L. Singleton, A-C vice president: "The apparatus can be bought from published price books of any manufacturer of this type of equipment. Since it's off-the-shelf merchandise, reflecting much the same material, labor, and overhead costs, it's evident that prices would be almost, if not entirely, identical.

"This situation holds for any off-the-shelf item, whether it's cigarettes, beans, or laundry soap. Competition is so keen that, once a manufacturer publishes a new price, his competition, to remain competitive, also moves to the lowest established price. Today's profit squeeze prohibits others from going lower. It's basic economics."

• **Common Practice** — A General Electric spokesman adds that, since the prices were quoted directly from handbooks, where the prices of most companies tend to seek the level that the customer is willing to pay, it's not at all unusual that identical prices would be quoted by competition. "It's no different from buying newspapers in New York City," he asserts.

Senator Kefauver contends that lack of price competition among domestic producers is a major contributing factor to inroads made by foreign competition. Industry observers contacted by STEEL believe it will be difficult for the senator to justify this attack.

Says one veteran observer: "Since most companies in an industry have their wage rates set by a single union, and unions demand pattern settlements, the labor costs on two competitive items are likely to be identical. Material costs can't differ much because the equipment is designed to the customer's specifications or sold off-the-shelf where items are fairly standard from one firm to another. It's hard to find significant variances in overhead costs among companies in the same field. The obvious result is nearly identical prices."

• **Threat from Abroad**—He continues: "Foreign competition is getting considerably tougher in the electrical equipment field. European manufacturers, with their lower labor rates, can easily underbid American firms by 25 to 30 per cent on large turbines and generators. They may even bid less in an effort to establish themselves more firmly in the American market."

English Electric Co. bid $6 million, against $9 million by Baldwin-Lima-Hamilton Corp., for a government job at Big Bend, S. Dak. Some U. S. producers think it was a loss leader bid, since the contract (for eight, 90,000 kw turbines) will be handled by a Canadian subsidiary of English Electric, and Canadian wage rates don't permit that great a difference in the price.

• **OCDM Says No** — Last year, General Electric and National Electrical Manufacturers Association filed petitions under Section 8 of the Trade Agreements Extension Act, charging that importation of heavy electrical equipment endangered national security. After much debate (see STEEL May 11, p. 102 and June 8, p. 63), OCDM issued its decision on June 12.

It concludes that imports are "not threatening to impair national security." It says that during a seven year period (July 1, 1951, to July 1, 1958), 284 pieces of foreign equipment were delivered and 77 pieces were still on order. Domestic producers made more than 30,000 units during that period. Competition is most severe in the big items: 27 generators were imported, while 275 were made in the U. S.; 14 hydraulic turbines were imported, while 275 were made domestically.

Of the nation's 3200 power stations, 102 have foreign equipment installed or on order. Of the 800 stations rated "essential to national security," 35 have foreign equipment.

• **Service Is Adequate** — Domestic producers assert that repair and maintenance of foreign equipment pose a problem. Says the Defense Department: "There have been serious isolated problems, but in general they can be handled without unusual costs. Repair of foreign equipment can be handled by domestic facilities or foreign manufacturers located in Canada."

However, OCDM Director Leo

A. Hoegh has promised to "take steps to see that federal agencies procuring heavy electrical equipment consider including in their invitations to bid a provision requiring bidders to provide adequate maintenance facilities on the North American continent."

• **What'll Happen at TVA** — The Tennessee Valley Authority plans to buy $50 million worth of turbines. Bids were due May 26, but when domestic producers failed to give quotations, the deadline was extended to June 16. General Electric, Westinghouse, Allis-Chalmers, and three foreign firms were invited to bid. Westinghouse offered to build the "largest steam turbine-generator unit in existence." Cost: $24 million. In TVA's original request for smaller units, Westinghouse bid $21.2 million to build two units. Westinghouse says the one big unit would produce 800,000 kw of electric power. The cost to TVA would be $30 per kw vs. about $34 per kw for the two original units.

Westinghouse also stresses the operating efficiency of the big machine. Domestic producers believe they can build machines that will produce cheaper power, despite a higher initial investment, than can foreign firms.

• **Conclusion** — Foreign producers will continue to claim a large portion of the domestic market for heavy electrical equipment. But the government will study the possibility of revamping its procurement policies to: 1. Include an allowance for more efficient equipment. 2. Give domestic producers a little better handicap to keep the government from losing money when the difference in bids is less than the tax revenue that would be gained through domestic production of the equipment.

Forms California Division

Illinois Tool Works, Chicago, established a Pacsol Div. at 500 E. Franklin St., El Segundo, Calif. The new division will carry on the business conducted by Pacific Solenoids Inc., which was purchased last year. N. Heath McDowell, general manager, will direct the operations.

Metalworking Gets Set for Expected Strike in Steel

STEEL USERS have 21 million tons in stock.

The sophisticated buyers are set for a month even if we have a strike. After six weeks of walkout, many consumers would be in trouble because of unbalanced inventories. After eight weeks, shortages would force mass shutdowns.

• **Lower than in 1956**—Although high, steel stocks today are 4 million tons less than they were on the eve of the 1956 strike. Importers hope to capitalize on the situation. Here are examples:

More foreign steel has come into Chicago already this year than in all of 1958. The Seaway accounts for only part of the great influx.

Some 50,000 tons of imported steel have been stockpiled in the Houston area by speculators. Some may be moved to other areas if prices and conditions warrant. Foreign steel prices continue to move upward. After being almost $40 a ton lower than U. S. quotations at the beginning of the year, some grades of foreign plates are now priced slightly above domestic mill prices.

Import agents for Japanese steel mills are offering west coast users up to 500 tons a month during the anticipated strike if they'll contract to keep buying the same amount for at least six months.

Mill product imports hit 229,000 tons in January, 241,000 in February, and 287,000 in March. Some observers think July will see 400,000 tons brought in if the strike is on.

• **Odds Favor Strike**—The betting last week leaned toward a strike sometime, but an old speculation revived. Will United Steelworker President David J. McDonald abandon his traditional no-contract, no-work stand and keep his men on the job after June 30? He would be waiting for a more propitious moment to press his case—perhaps in early fall when auto companies need more steel for new models, or perhaps only until late July when the steel companies are due to announce their second quarter and first half earnings. They are expected to be excellent. With those good reports to point to, he would then have a stronger argument in his fight for higher wages.

As the auto industry did last year, the steel producers would probably continue operating without a labor contract. But it's unlikely that they would budge in their position.

Giving support to speculation: Last week, USW was considering an industry offer to keep bargaining and operating for ten days after the June 30 deadline.

• **Selective Strike?**—It is not likely that the USW will strike selectively. The union's general counsel, Arthur Goldberg, favors that course, but other officials in the organization, especially Mr. McDonald, prefer traditional industry-wide walkouts.

Just in case of a selective strike, the industry has developed a mutual assistance program, although it hasn't been signed. There would be no profit sharing. Companies that continued to operate during a selective strike would probably lend money to any that were in bad shape.

• **The Government Angle** — Sen. Stuart Symington (D., Mo.) has twice asked President Eisenhower to intervene, but for the time being the U. S. will confine its official action to quiet offers of mediation if the strike begins (see the following story). Nor will the Labor Department issue "impartial" figures on steel profits, wages, and productivity. "There's no such animal," points out one Washington man.

U. S. officials are considering what to do about steel distribution in case of a long walkout (see details, Page 56), but even in that

area they see no need for drastic action unless the strike lasts longer than 30 days. The Interstate Commerce Commission has moved to prevent a protracted freight car tie-up. The ICC order prohibits railroads serving ocean and Great Lakes ports from taking iron ore shipments destined for strikebound steel plants. It becomes effective for two months beginning 12:01 a.m. on July 1.

• **Deadline Near**—That Washington order is tangible proof of the feelings about the steel talks. The USW has stripped down some of its 250 demands into a streamlined package, but it left the industry cold. Union negotiators at one of the bargaining sessions with an individual steel company candidly admitted: "We've been thinking in terms of about 40 cents an hour for each year of the contract."

The only hope for eventual settlement is a concession by the union on operating procedures, which will permit efficiencies, in exchange for a wage increase. A high official of a steel company puts it this way:

"We don't want a net increase in employment costs, and we're willing to take a strike to avoid it. There will be no employment cost increase for productivity or any other reason."

Space Spending to Rise

National expenditures of more than $13 billion annually by the mid-1960s will go into space, missile, and aircraft equipment, says William F. E. Long, marketing data manager of the Electronic Industries Association.

Mr. Long told the second National Missile Industry Conference at Washington that the electronics industry would receive $5 billion in outlays, or 38 per cent of the total. By 1970, total aircraft and space spending will reach $14 billion, with some $6 billion going into electronics, he said.

"Since the space effort (space vehicles and satellites) has a complementary effect on our missile effort, we consider that missile expenditures are expected to increase from their present annual rate of $3.4 billion to somewhat less than $9 billion by the end of the decade.

Federal Mediator Joseph Finnegan says . . .

U.S. Sits in If USW Strikes

THE GOVERNMENT'S mediation service will help bring steel management and labor to terms if we have a strike.

"I don't know when we'll act. We're playing that by ear," says Joseph F. Finnegan, director of the Federal Mediation & Conciliation Service. In the 1956 strike, he moved in on the first day of the walkout, July 1, and stayed with the situation until the settlement. FMCS can act on its own motion in entering labor disputes, does not have to await invitations.

• **Interviewed Both Sides** — Two weeks ago, Mr. Finnegan met Steelworker President David J. McDonald to get his position. Last Monday, he talked with U. S. Steel Corp.'s Vice President R. Conrad Cooper to hear the industry's case.

"Neither side wants us in now," says Mr. Finnegan. "At the current stage, mediation would probably do more harm than good. Either side, or both, might freeze up in their offers and bargaining progress would be slowed."

• **Action Needed**—But if the steelworkers hit the bricks, look for Mr. Finnegan to move soon. He'll head the mediators' panel. Other members will be:

Robert H. Moore, deputy director of FMCS; Walter Maggiolo, director of mediation services; and Robert W. Donnahoo, director of FMCS' Region 2 which comprises Pennsylvania, West Virginia, Maryland, District of Columbia, and part of New Jersey.

• **Other U. S. Moves?**—The mediation action will probably be the only official machinery the government will use if we have a steel strike. Labor observers think it unlikely that the President will invoke the 80-day cooling off period allowed under the Taft-Hartley Act.

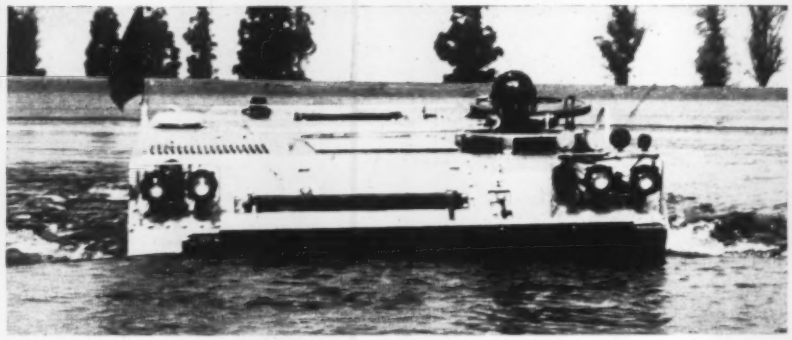
Unofficially, the President may exert pressure on both sides from behind the scenes, as in 1956.

Reynolds' George Bailey is selling aluminum as a concept to the military strategists and designers. To the right are some examples of new military uses of aluminum.

An Aluminum Army?

U. S. Army Ordnance Corps vehicles in the testing stage contain these amounts of the light metal.

	POUNDS
M-113 (personnel carrier)	8,000
T-257 (mortar carrier)	7,500
T-114 (personnel carrier)	6,000
M-56 (gun motor carriage)	1,500
T-195 (self-propelled artillery)	12,000
XM-410 (truck)	1,700
XM-408 (truck)	3,000



M-113

Aluminum Target: U. S. Army

THE ALUMINUM INDUSTRY is focusing its attention on the U. S. Army as a consumer calculated to replace dwindling aircraft markets. Aluminum goes into missiles, of course, but not in tonnages comparable to that of aircraft.

• In 1958, perhaps 8 or 9 per cent of aluminum's markets were military products.

With the current drive to sell the Army on the light metal, the market research division of a large manufacturer believes it will take two years at the most for new ground equipment and missile uses to make up for the loss in aircraft tonnage. If the $5 billion to $15 billion Army modernization program ever is approved by Congress, the industry will benefit tremendously. Flying tanks, floating personnel carriers, mobile missiles are here; they have only to be ordered in quantity.

The Navy, traditionally a heavy user of aluminum for superstructures (it provides a lower center of gravity), is also a big customer in the new age. Two cruisers being converted to missiles may each use about 1 million lb of the metal. Besides going into the glamorous ground skimming devices and flying "jeeps," aluminum is being used in overland conveyors, tank engines, and rubber tired trains for Arctic research. The Army's new M-60 tank has an engine and parts containing 7000 lb of aluminum.

• Since 1957, when aluminum was removed from the Pentagon's list of critical materials in short supply, the industry has been itching to get new programs rolling for the military.

George Bailey, manager, Federal Sales Div., Reynolds Metals Co., Washington, tells STEEL that military designers still ask him to prove the availability of aluminum. (Its benefits are well recognized.) High defense officials have testified to Congress that aluminum armor plate saves 50 per cent or more in weight compared with steel. Reynolds cites such benefits as fuel economy, better protection, less maintenance, and air dropability.

Mr. Bailey admits he is selling a

concept of aluminum to the Pentagon, and not just Reynolds aluminum. Insiders figure Reynolds would like to grab about 35 per cent of the military market. It's reported that Thompson Ramo Wooldridge Inc. has ordered 10,000 lb of plates and extrusions for Pershing (the solid fueled, Army missile) prototype transporter-erector-launchers and that the bird's airframe will be aluminum.

• To get the concept sold, Reynolds offers free aluminum consulting and engineering services to the Pentagon and military fabricators.

The industry generally finds that military fabricators use aluminum as well as steel. Mr. Bailey believes it is part of his job to see that the aluminum is used properly.

The industry is conscious of its vulnerability to failure in this new field. Thus steel fabricators may need advice from firms like Reynolds on the proper alloy and specialized welding or finishing problems connected with their new military contracts.

Ground support equipment for missiles may be a particularly hot market. You can expect the Minuteman system to contain plenty of aluminum. Special vehicle designs are being developed for the equipment now. Earlier, standard trucks were converted to ground support equipment.

How far will Reynolds' consultants go? Mr. Bailey suggests: "We'll talk to anyone—right down to the small sub-subcontractor with a small order." Of course, he prefers to catch the new weapon process as early as possible, to insure the use of aluminum. That's why he likes to have the engineering and product development divisions work directly with designers. He advises a fabricator not using aluminum that some new equipment is required, particularly for welding. Above all, he must know the choice of alloys available.

He figures the Army is well into its testing phase of the trend to aluminum. Another three years may see the beginning of some important large orders for equipment using the light metal. The potential is so great, he hesitates to say more than that "several hundred million pounds a year" can go to the military.

Alcoa to Build; Joins English Firm

ALUMINUM CO. of America will join giant Imperial Chemical Industries Ltd. of Great Britain in a move to expand world markets for aluminum.

The two companies are forming a partnership (Alcoa will own 49 per cent; Imperial, 51), subject only to the approval of the British Treasury—which is expected shortly. They'll set up a new aluminum fabricating and processing company, to be called Imperial Aluminum Co. Ltd. It will operate Imperial's expanded mill in South Wales.

Industry observers interpret the Alcoa move as an answer to Reynolds Metals Co.'s entry into the British market in January. Reynolds joined Tube Investments Ltd. to gain control of British Aluminium Co. Ltd.

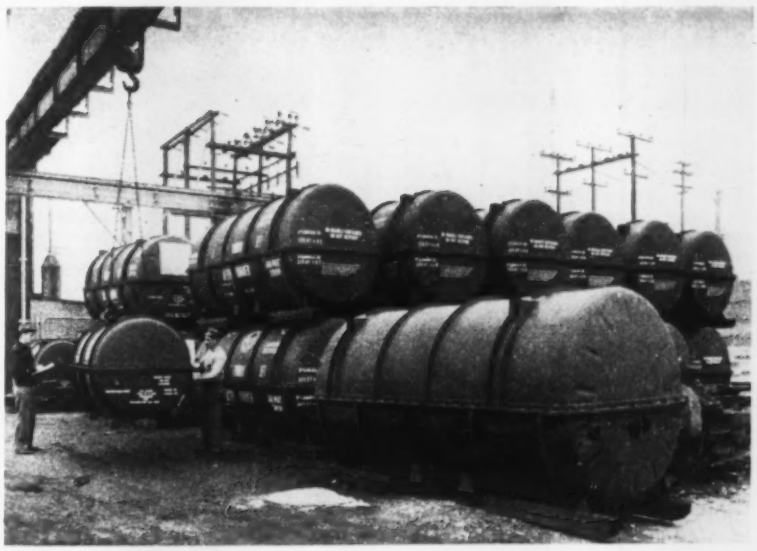
Implications of the Alcoa move are wider markets for aluminum and stronger competition in world markets.

Memo on Missiles

Put Wallops Island, Va., on your sales map of government installations. A National Aeronautics & Space Administration facility there will soon be an important customer for metalworking products ranging from fire trucks to steel towers to radar units. . . The Air Force is sponsoring new standards on ground support equipment for missiles. First technical data sheets may be published next month. . . Look for a new Army "breakout" policy to open doors for contract opportunities to many small companies not now in the missile field. Under the "breakout" program the Army tries to use, in the production of any missile system, as many components as possible that are already developed and standardized. The "breakout" policy is a result of Congressional prodding to spread the missile dollar among more metalworking firms.

Auto Estimate Upped

George Hitchings, Ford Motor Co.'s economic analysis chief, now predicts that 1959 car sales will be at least 3 or 4 per cent higher than the 6 million earlier anticipated. He also reports that gross national product is running at a $478 billion annual rate and that the physical volume of business is 4 per cent above the prerecession peak, mid-1957.



RE-USABLE CONTAINERS protect aircraft engines from oxidation and shock during storage and shipment. They're made of high strength, low alloy steel, at Baltimore Steel Co., Baltimore. Jalten, a steel produced by Jones & Laughlin Steel Corp., Pittsburgh, is used in making tops, bottoms, and ends for the containers

Lighting Can Brighten Your Profits

IN YOUR QUEST for ways to improve productivity, don't overlook lighting. It's an important production tool. By upgrading it, you can boost efficiency, curtail accidents, reduce employee fatigue, slash reject volume, heighten worker morale, and improve your plant's appearance.

That's what STEEL found in a study of more than 125 industrial lighting installations.

• **Example No. 1**—Erickson Tool Co., Cleveland, hiked worker efficiency 10 per cent, cut minor accidents in half, and decreased rejects about 5 per cent in one department, more than 10 per cent in another—all as the result of a new lighting system.

A setup like Erickson's (GE Power-Groove fluorescent tubes, two lamp fixtures in continuous rows on 10 ft centers, providing 200 foot-candles of uniform light and 300 foot-candles in difficult seeing areas) costs between 7 and 11 cents per manhour to install, operate, and maintain. That means you can make such an investment pay for itself if productivity increases between 1.1 and 2.2 per cent. (Erickson got 10 per cent.)

That productivity measurement is figured on these cost ranges: Power, 1 to 3 cents per kw-hr; labor, $2.50 to $3.70 an hour; tax write-off, 10 years at 10 per cent a year; interest, insurance, and taxes, 5 per cent. Use of lamps is estimated at 2500 hours a year in a single shift operation. If you run more shifts, your cost is lower.

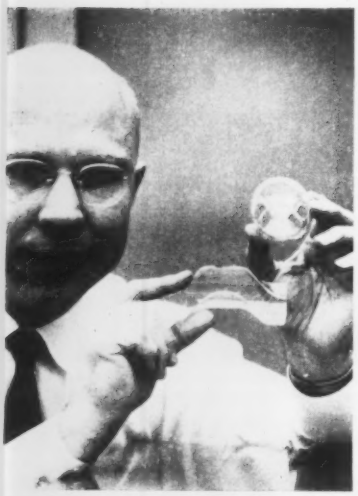
• **Example No. 2**—A 200 foot-candle installation at Metwood Mfg. Corp., Gardena, Calif., paid for itself in less than a year. Productivity zoomed 16 per cent and rejects dropped 26 per cent. Workers no longer complain of eyestrain and morale has improved considerably, says a company officer.

• **Example No. 3**—Frawley Corp., Culver City, Calif., realized production gains of up to 28 per cent from its older workers after relighting an assembly area. The installation would have paid for itself if productivity had risen only 0.4 per cent.

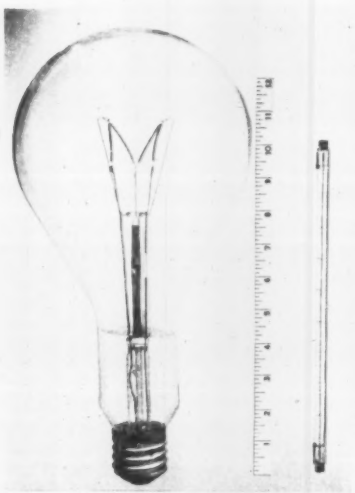
• **Example No. 4** — Douglas Aircraft Co. boosted the lighting level to 500 foot-candles in a small electronic equipment assembly area. Management was so pleased with the gain in production that it had the lighting system extended over the whole assembly area.

• **Example No. 5**—A machine shop eliminated supplementary lighting on the machines by installing a new system giving 160 foot-candles of light for general seeing and 250 foot-candles over difficult areas. Accidents dropped 50 per cent; rejects declined 15 per cent; production rose 10 per cent. Cost of the new system: 0.7 cent per foot-candle for each 10,000 sq ft.

• **What Users Say**—Lost time accidents dropped 40 per cent after



GE Physicist J. O. Aicher shows cross-sectional views of the new GE Power-Groove lamp that produces 15 per cent more light with only 7 per cent more electric power. Reason: Both sides of the tube are grooved, placing part of the inside phosphor coating closer to the arc stream



The pencil thin Quartzline lamp on the right is 200 times smaller than the standard light on the left, but will give 10 per cent more light. It will also clean itself, inside and out, due to high operating temperatures coupled with traces of iodine gas in the tube, say GE engineers

This heavy duty Millite, designed by Westinghouse, is 24 in. in diameter. The reflector is heavy gage aluminum spun from a single sheet. The lens is ¼ in. thick, highly polished, and heat treated to resist thermal shock and breakage from impact. All exposed parts are corrosion resistant

a new lighting installation, reports Jones & Laughlin Steel Corp., Muncy, Pa.

Morris Machine Tool Co., Cincinnati, reports "50 per cent fewer accidents" after it relighted and repainted production areas.

Employee turnover dropped 25 per cent, absenteeism fell 30 per cent, after Oregon Chain Saw Corp., Portland, Oreg., installed a 100 foot-candle system over its manual assembly area.

• **How Much Do You Need?**—You should have 50 foot-candles of light to comfortably read this article. At least twice that much is needed for medium assembly work. Twenty-two times as much is required for fine sanding and finishing and 70 times as much is needed in precision diemaking to maintain the same level of vision, reports General Electric Co.

Here are examples of the minimum amounts of light (in foot-candles) recommended by the Illuminating Engineering Society for various operations:

Assembly: Rough	30-50
Medium	100
Fine	500
Extra Fine	1000
Drafting offices	200
Accounting, bookkeeping	150
Regular officework	100
Stairways, service areas	20
Open hearth charging	20
Rolling mills	30-50
Foundry: Coremaking	50-100
Pouring	50
Shakeout	30
Forge shops	50
Sheet metalwork	50
Plating	30
Polishing, burnishing	100
Drilling, riveting	70

• **What Does It Cost?**—You can install, operate, and maintain a good lighting system for about a penny an hour per foot-candle for each 10,000 sq ft of work area. The average company finds it can have topnotch lighting in its plant for about a nickel per man per hour.

If your average employee earns, say $2.50 an hour, a 1 per cent increase in productivity will more than pay for the lighting. Some companies find that it's profitable to relight just to lower accident frequency or improve housekeeping.

You can see the difference that good lighting makes in these before and after views of a machining area at Continental Aviation Corp.'s Toledo, Ohio, plant. Components for the company's turbojet engines are made in this area. The old lighting system provided 10 foot-candles of uniform light. The new system gives a minimum of 70 foot-candles. Says Plant Engineer Victor Morris: "Relighting has improved productivity, considerably reduced employee fatigue, greatly aided housekeeping, and given us a safer plant in which to work."

• **What's New in Lighting?**—The three examples pictured on Page 54 indicate lighting equipment manufacturers' efforts to obtain more light for less cost. And they don't stop with the light bulb. Westinghouse, for example, recently introduced a corrosion resistant Luminaire for use above pickling, heat treating, chemical processing, and other highly corrosive areas. The company claims it will cut replacement costs as much as 75 per cent.

• **There's More to Come** — "We need still higher powered, more efficient light sources," says GE's A. C. Barr. "Efforts to lower costs and improve heat dissipation must be continued; better techniques in design, installation, and maintenance must be developed."

Expect manufacturers to direct much of their effort in these three directions: 1. Transistorized, high frequency, lighting systems. (Both GE and Westinghouse have experimental operations in the field.) 2. Miniaturization. (GE's Quartzline is a preview of what is to come.) 3. Electroluminescence. (Much research is underway on low temperature lighting but breakthroughs are needed.)

BDSA May Act in Steel Strike

THE U. S. may put some steels under allocation if a steel strike lasts longer than 30 days.

Last week it was too early to decide what to do, but the Business & Defense Services Administration, which would administer any allocation program, would probably follow the precedent of control action taken during the 1956 walkout.

The principal move then was a freeze on warehouse stocks. Nondefense users were put on a weekly quantity quota for certain products when the distributor's stocks fell below 50 per cent of his June 30 inventory level. Products included aircraft steel in all forms and shapes, nickel-bearing stainless and nonstainless alloy steels, carbon pipe, tubing, bars, and bar shapes (except reinforcing).

In the strike beginning July 1 three years ago, the U. S. established allocations as early as July 6. This time, any government move is not likely to come so soon—probably not unless the strike is still on after a month. That's because stocks of critical material held by our missile, aircraft, and atomic energy contractors are believed higher than they were in 1956.

DMS Still Functions

In the early days of a steel strike, BDSA would probably limit its actions to reminders that the Defense Materials System (DMS) with its set-aside provisions still functions. Under it, stated quantities of steel, aluminum, copper, and nickel alloys are set aside for defense priority each quarter. Defense contractors' orders must be honored first by the metal producers, provided the set-aside limit has not been passed.

The set-aside provision in DMS has been largely academic in the last couple of years because supplies of all four metals have been more than ample. For steel, set-asides may become vital once again.

Affected by set-asides would be the 50-odd steel companies that will still be operating in July even if there is a general strike. They account for only about 12 per cent of U. S. capacity.

Rules Will Be Simplified

Look for new regulations to come out soon to simplify DMS. June 30 was the original target date for the changes, but they probably won't be ready until sometime in July. No basic shifts are in the works—just procedural improvements which will cut the paperwork and ease the burden on defense contractors.

DMS was born at the end of the Korean War. During that conflict, economic resources were programed with a special version of the Controlled Materials Plan (CMP) used during World War II. When the Korean affair ended in 1953, DMS was developed as a peacetime version of CMP—the first time in U. S. history in which legislation has authorized the President to compel the acceptance and performance of contracts to promote the national defense when the nation was not in a hot war.

DMS is the idling engine of a control system maintained as a readiness measure. At present, DMS doesn't really control anything, but it will show its teeth during a steel strike if defense contractors need it to get the metal to fulfill their delivery schedules.

Aside from its use for emergencies, DMS has served one other purpose—as the source for statistics on the amount of metal going into defense.

DMS has come to be so taken for granted that it has sometimes been forgotten. Last November, the steel industry had to send out more than 100,000 letters reminding customers that the law required them to use DMS if they were defense contractors and pointing out the statistical benefits stemming from their compliance.

Senate Actions Hit Top Men

Two actions in the Senate will make it tougher for both government and industry to get top men.

The Senate's refusal to confirm Adm. Lewis L. Strauss as secretary of commerce marks the first time since 1925 that a cabinet officer has not been confirmed and only the eighth time in all of U. S. history that a cabinet nominee has been turned down. With the Senate in this mood, how many men will want to go through what Admiral Strauss experienced?

The other disturbing note stems from charges by Sen. Paul Douglas (D., Ill.) that 721 ex-Army, Navy, or Air Force officers now occupy important posts with industry where their former service connections might unduly influence defense contract awards.

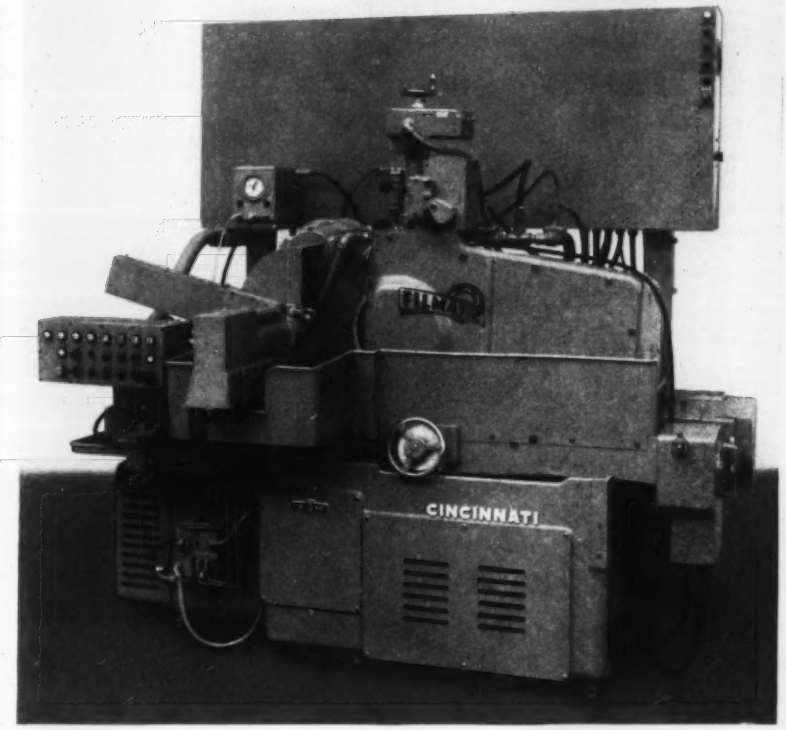
The trigger that started the senator shooting was the appointment of Lt. Gen. C. S. Irvine as director of planning for Avco Mfg. Corp. He had been deputy chief of staff for air materiel for the Air Force. A 32-year service veteran, he had not been granted his fourth star, so resigned.

The senator's blast may make other top officers reluctant to take top business posts.

CINCINNATI COMBINES

SUPERIOR CHUCKING GRINDER PERFORMANCE

with WIDE VARIETY OF TOOLING



Production and quality are automatically controlled by the ingenious tooling and extra equipment on this CINCINNATI FILMATIC No. 2 Chucking Grinder. These grinders are built in two sizes: No. 1—Capacity 0" to 4" diam. No. 2—Capacity 2" to 10" diam. Catalog No. G-685

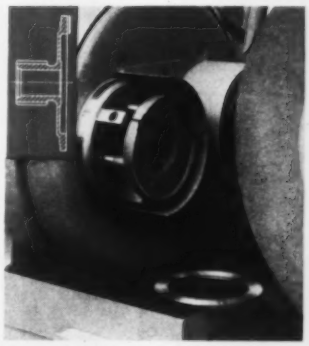
The chucking method of grinding is not always well defined. But Cincinnati Grinding Specialists know exactly when it should be applied . . . and have the opportunity to weigh it against both centertype and centerless methods.

In numerous applications CINCINNATI FILMATIC Chucking Grinders produce hundreds or millions at lowest cost. Built with single or two-spindle headstock, these precision grinders can readily be tooled up with a wide range of positive chucking and work locating arrangements . . . including manual or push-button profile truing; automatic cross feed compensation; crush truing; automatic gap eliminator; automatic air-electric gage sizing.

The machine itself incorporates many important feature-advantages, such as FILMATIC grinding wheel spindle bearings; variable-angle headstock positioning; extra sensitive automatic dual rate infeed; two-speed cross slide handwheel; super-accurate headstock spindles. *No longer is it necessary to grind on dead centers to obtain high accuracy.*

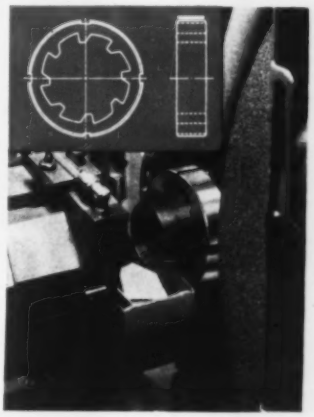
Complete specs for CINCINNATI FILMATIC Chucking Grinders are in catalog G-685. Write for your copy today.

Grinding Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio



Two-spindle headstock, pneumatic diaphragm chucks, automatic truing, manual loading. Finished ground part is shown in foreground. Heavy line in part drawing indicates ground surface.

Part name ..... Transmission gear
Operation ..... Grind face
Material ..... Steel
Production ..... 94 per hour



Single spindle, automatic production including air-electric gage sizing, cross slide compensation, automatic loading, etc. Heavy line in part drawing indicates ground surface.

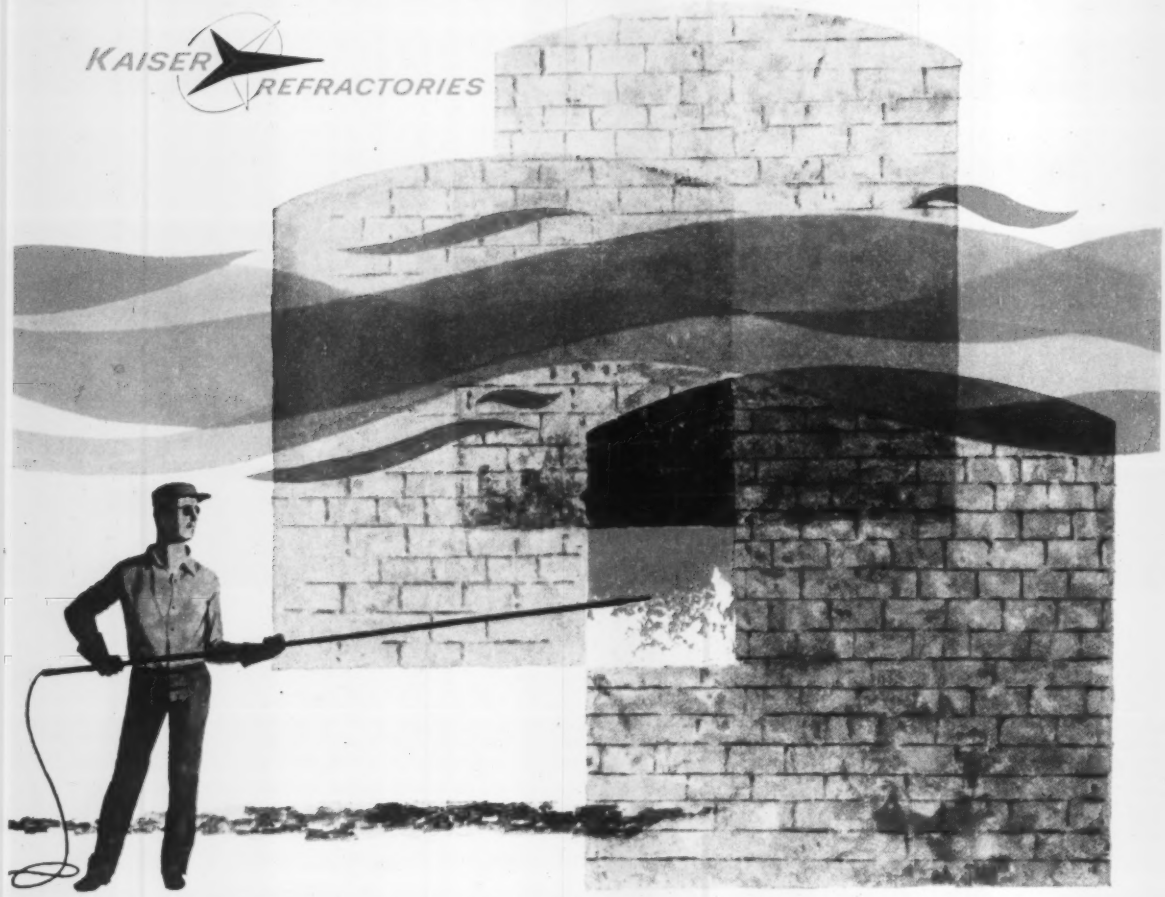
Part name ..... Clutch race
Operation ..... Grind O.D.
Material ..... Steel
Production ..... 192 per hour

CINCINNATI

PRECISION GRINDING MACHINES: CENTERTYPE • CENTERLESS • MICRO-CENTRIC • ROLL • CHUCKING • CENTERLESS LAPPING

CINCINNATI®
GRINDING MACHINE DIVISION

KAISER REFRACTORIES



3 Campaigns with open hearth endwalls of Kaiser Periclase Chrome Brick!

• "Took off #6 Open Hearth and found Kaiser Periclase Chrome Brick looked so good in the endwalls that they were left in for the third campaign."

• "After two campaigns of 90 and 106 heats, Brand 'A' were removed from the down-river end and Kaiser Periclase Chrome Brick are going to complete a third campaign in the up-river end."

• "Furnace this month finished third campaign of 176 heats, and at that time Kaiser Periclase Chrome endwall had gone through 562 heats. At this writing, this endwall has approximately 600 heats . . ."

Every month reports like these bring more and more dramatic evidence of improved endwall service. And more often than not, these reports show how *new shop records* have been established with Kaiser Periclase Chrome Brick. Here are the properties that make possible such performance:

1. Volume Stability. Chromite content is the minimum amount necessary to provide resistance to thermal shock. Lowering of chromite also reduces swelling in presence of iron oxide, thus minimizes buckling and peeling.

2. Uniform High Strength because ceramic bond is formed *before* the chemical bond burns out.

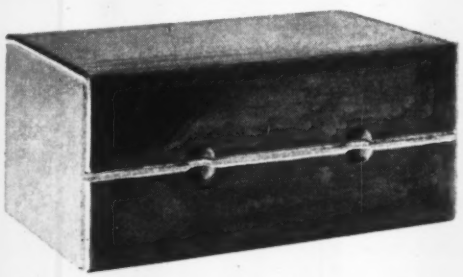
3. Outstanding Resistance to Distortion and Shrinkage because there is no liquid phase in the conversion from chemical to ceramic bond.

4. Excellent Resistance to Chemical Attack by furnace fumes, iron oxides and slags is assured by high magnesium content, maximum brick density (low porosity) and chemically stable composition.

Make a comparison test and see how much more life you get with Kaiser Periclase Chrome Brick. Your Kaiser Refractories Sales Engineer will be glad to help.

Call or write Kaiser Chemicals Division, Dept. S9241, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

PITTSBURGH 22, PA. . . . . 3 Gateway Center
HAMMOND, IND. . . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . . 1924 Broadway



Refractory Brick & Ramming Materials • K/R Gunning Systems
Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite • Aluminas

How a Sales Tool Grew up

FROM THIS

Wales-Strippit Inc., Akron, N. Y., first hit the road to customer plants in 1949. Today it has rolling sheet metal shop with self-contained power (below)

TO THIS

Originally, demonstrations were in customer plants. Company now has plant on wheels. Prospective buyers (bottom photo) watch high speed punch press in action

Appliance Sales Headed for Record

CONSUMER product sales of the major appliance industry should reach a record this year, predicts Westinghouse Electric Corp.

"For the first five months of 1959, distributor sales to dealers of refrigerators, freezers, electric ranges, and home laundry equipment are running 19.5 per cent ahead of those in the 1958 period," says Richard J. Sargent, head of the Westinghouse consumer product marketing group.

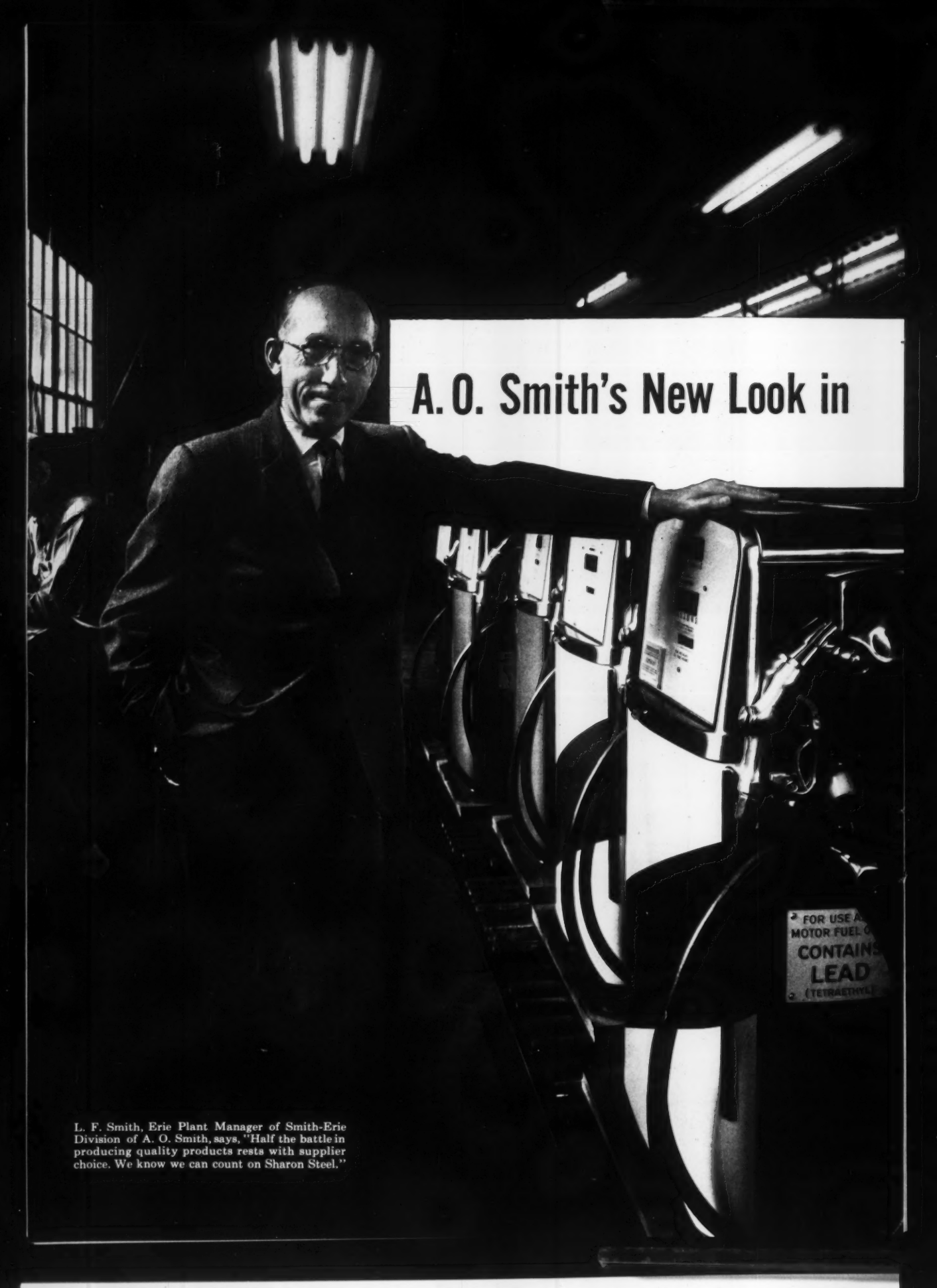
• **All Ahead**—The year's sales will top the 1956 level if they maintain only a 9 per cent gain over last year's for the balance of this year, says Mr. Sargent. A breakdown shows sales of automatic washers are 13 per cent ahead of last year's; electric dryers 8 per cent ahead; free standing ranges 15 per cent higher; and built-in ranges 47 per cent higher. Outstanding sales have put refrigerators 23 per cent ahead of the year ago period; home freezers are running 35 per cent ahead.

Room air conditioner sales have been "rather peculiar," says Mr. Sargent. They're off 25 per cent because retailers bought heavily last fall before an excise tax went into effect Jan. 1.

Combined factory and distributor inventory at the end of April was 24 per cent higher than it was in April last year, but was 7 per cent lower than April, 1956; 14 per cent lower than in April, 1957.

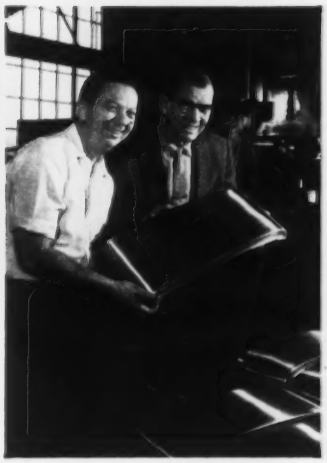
• **Prices Lower**—Prices in all lines remain competitive, says Mr. Sargent, with most dealers stressing price rather than features in their selling. "However, this industry has a long way to go before prices are in line with increased costs of labor and material. Material costs have risen 19 per cent in the last ten years; wage rates have gone up 50 per cent. Yet 1959 prices on many appliances are below 1949 prices on similar models."

A good year in home building will give the appliance industry a real boost, says Mr. Sargent.



L. F. Smith, Erie Plant Manager of Smith-Erie Division of A. O. Smith, says, "Half the battle in producing quality products rests with supplier choice. We know we can count on Sharon Steel."

P. R. Fishburn, Manager of Production and R. W. Swank, Manager of Research and Development, agree on selection of Sharon Stainless.



Charles MacIntosh, Supt. of Assembly and Harold L. Ripley, Supt. of Machine Shop, like the way Sharon Stainless handles in production.

Gas Pumps Begins with . .

Quality Steels

Sharon Stainless Shrugs Off Weather, Corrosive Atmospheres

A. O. Smith Corporation has a reputation for quality that can only come from years of supplying products that perform as they were meant to. Such a reputation is a valued business commodity and A. O. Smith works hard to protect it. That's the reason they work with suppliers like Sharon Steel—to make certain they get the finest materials—right from the start.

In their new gasoline pump line A. O. Smith's Smith-Erie Division wanted a modern unit that would not only look well, but one that would withstand the ravages of weather and corrosive atmospheres, yet be easy to care for. To meet these requisites they specified stainless steel. To make certain of the best in stainless, they selected Sharon Quality Stainless Steel. *Sharon Steel Corporation, Sharon, Pa.*

Smith and his Purchasing Agent, J. E. Robison, like Sharon's "Service after Sale" policy. Here they talk shop with Sharon salesman Gordon Garrett.

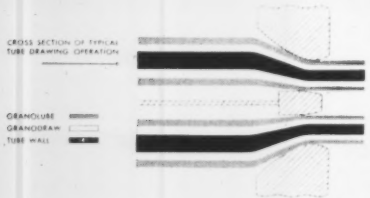
SHARONSTEEL **SHARON** *Quality* **STEEL**

AMCHEM Information Bulletin

CHEMICAL CONVERSION COATINGS and their functions in facilitating the cold mechanical deformation of metals

By ARTHUR DAHL, Product Development Dept., AMCHEM PRODUCTS, INC.

When used to facilitate the cold mechanical deformation of metals (in drawing, extrusion, stamping, cold heading, necking, and upsetting operations) chemical conversion coatings in conjunction with suitable lubricants perform three important functions. One, they prevent metal-to-metal contact between work and tool. Two, they prevent galling and seizing. Three, they protect stock indefinitely, permitting the storage of in-process work at any stage of production, without danger of corrosion damage.



Characteristic of the tightly bound, highly absorptive, crystalline coating formed by the processes is the ability of the coating to retain lubricity throughout forming operations when treated with a suitable lubricant. This offers the following production advantages:

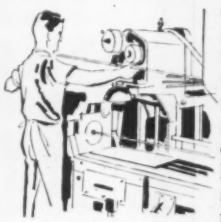
- **Higher degree of reduction**
- **Greater speed of draw**
- **Longer tool life**
- **Fewer process anneals and pickling**
- **Finer surface finish**
- **Cleaner mills**
- **Easier inspection of finished product**

Also of interest to production men is the exact duplication of coatings from batch to batch. And the processes are much simpler than other methods of coating metals—baths can be set up and running in less time than it takes to determine suitable coatings by other methods.

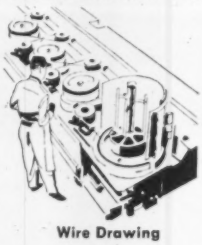
TYPES OF COATINGS AND THE METALS FOR WHICH THEY ARE DESIGNED

Zinc phosphate coatings for carbon steel. These coatings can be applied by either dip or spray systems.

Dip. Amchem Granodraw No. 1 is typical of the dip process. The sequence includes precleaning, water rinse, pickling, water rinse, water rinse, Granodraw No. 1 solution, water rinse, and a hot neutralizing rinse. Surfaces to be treated must be free of oil, grease, rust and scale. The above sequence insures that they will be. And when metal is free of rust and scale, the pickling bath and two succeeding water rinses can be omitted. In either case, a lubricant like Amchem Granolube or conventional lubricant must be applied prior to working the metal.

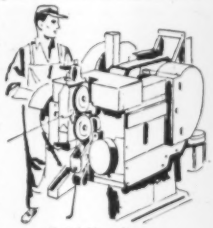

Tube Drawing

Spray. Amchem Granodraw No. 4 is an example of the spray process. It usually requires 5-stage equipment and includes the following steps: precleaning, water rinse, Granodraw No. 4 solution, water rinse, lubricant. After chemical treatment, the work must be dried before forming.

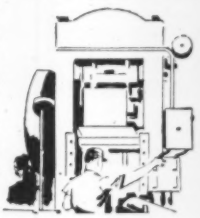

Wire Drawing

Oxalate Coatings for the stainless steels and many of the high-nickel alloys. These coatings are applied only by immersion process, and usually in a 5-stage system which includes an acid pickling or depassivating bath, a water rinse, the Amchem Granodraw SS coating bath, a hot borax neutralizing rinse for wire stock, or a lubricating bath for tube stock. Since thorough activation of the metal surface is necessary to promote an adherent coating, the pickling and activating bath is an important stage in processing.

Fluoride-type coatings for zirconium and its alloys. Granodraw ZR is such a coating. It is applied in an immersion process which includes precleaning, water rinse, pickling, water rinse, Granodraw ZR solution, water rinse, drying or lubricating. It has been used primarily in the treatment of stock prior to wire drawing and tube drawing. Surfaces are cleaned of oil and grease by solvent degreasing or alkali cleaning. Pickling is required to provide a surface that is chemically and metallurgically receptive to the coating.


Cold Heading

Amorphous phosphate coatings for aluminum. This type of coating is now in the development stage. Laboratory and field tests are being conducted, results are being evaluated, and modifications in chemical make-up and process sequence are being made to meet requirements. Several field tests, however, have indicated that it will do the same job for aluminum processors as the other types of coatings have done for those working carbon steel, stainless steel, high-nickel alloy, and zirconium.

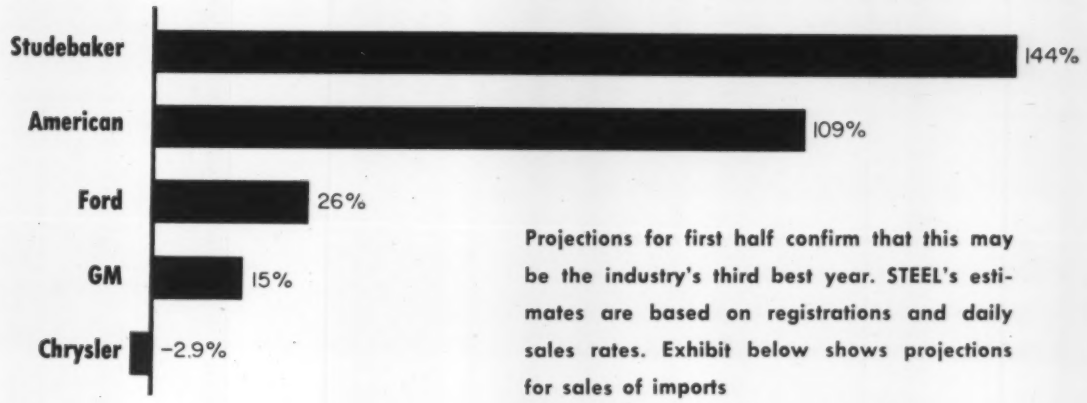

Impact Extrusion

For more information write us at Ambler.

AMCHEM PRODUCTS, INC. (Formerly American Chemical Paint Co.)
AMBLER 27, PA. • Detroit, Mich., St. Joseph, Mo., Niles, Calif., Windsor, Ont.
Amchem, Granodraw and Granolube are registered trademarks of Amchem Products, Inc.

U.S. Car Sales up 24% at Midyear

Changes in Projected Registrations—First Half '59 vs. First Half '58



Projections for first half confirm that this may be the industry's third best year. STEEL's estimates are based on registrations and daily sales rates. Exhibit below shows projections for sales of imports

Import Sales Expected to Jump 75%

First Half '59	First Half '58
280,000	159,367

Volkswagen continues to set the pace, but other makes are catching up. Here's how six leaders fare in import market:

First Half '59	First Half '58
Volkswagen 18%	Volkswagen 25.3%
Renault 14%	Renault 11.1%
Eng. Ford 11%	Eng. Ford 8.6%
Fiat 7%	Fiat 4.9%
Simca 8%	Simca 4.5%
Opel 7%	Opel 3.7%*

*Projected.

PROJECT current selling rates and it's obvious that automakers will have sold 3 million cars in the first half of 1959 compared with 2.6 million in the same period of 1958. That includes imports, but Detroit will dispose of 5.5 million domestically built autos in 1959.

The anticipated midyear figures show American Motors Corp. and Studebaker-Packard Corp. are the big gainers. They're now taking 6 and 3 per cent of the market respectively. General Motors Corp. is accounting for 48 per cent of total sales. Last year, it held 52 per cent at the half. Pontiac is GM's hottest car. It stands a chance of taking third place in the sales race if it can edge out Oldsmobile and Plymouth.

Buick is slow to recover although the division forecasts a 10 to 15 per cent increase in sales over 1958's.

• **Galaxie Is Hot**—Ford's Galaxie is outselling other Ford Div. lines 2 to 1, say company sources. Thunderbird sales are double last year's. Some 38,200 T-Birds have been

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

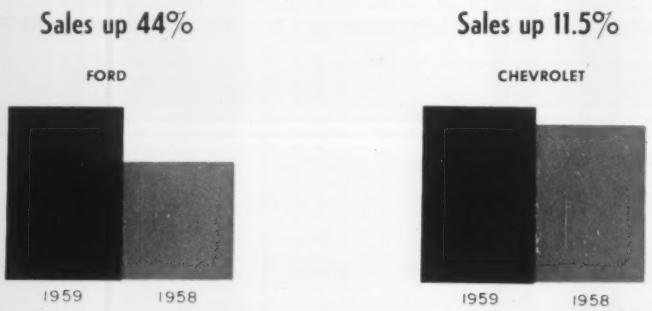
Where Each Make Stands

(Thousands of units)

	1959*	1958
Chevrolet	735.3	659.5
Pontiac	195.6	122.3
Oldsmobile	196.5	168.1
Buick	**132.0**	141.5
Cadillac	78.2	68.0
GM's total	1337.6	1159.4
Ford	731.4	500.5
Edsel	23.6	22.0
Mercury	76.4	70.8
Lincoln	16.6	15.5
Ford's total	848.0	608.8
Plymouth	**197.3**	201.8
Dodge	**68.4**	68.7
De Soto	**24.7**	26.5
Chrysler	**30.1**	32.4
Imperial	**7.6**	8.4
Chrysler's total	**328.1**	337.8
American Motors	163.5	78.5
Studebaker-Packard	64.3	22.6
Total Sales	2741.5	2207.1

*Preliminary.

Ford Gains on Chevrolet in First Half



built so far and the company has a backlog of 7000 orders. Ford is taking 30 per cent of the market against 28 per cent last year.

Chrysler still hasn't made up the losses it suffered during the crippling glass strike early this year. It's holding about 13 per cent of the market against 15.7 per cent a year ago. Those figures do not include import sales. To beat STEEL's projected first half figures, the company's dealers would have had to peddle cars at double the industry's daily sales rate all through June. Chrysler has already built enough '59 models to pull its sales ahead of last year's. Now all it has to do is sell them.

• **Imports Still Strong** — Despite earlier wishful thinking that imports have reached a peak, first half sales show that only Volkswagen's share of that market has slipped—from 25.3 to 18 per cent. Renault has climbed from 11.1 to 14 per cent.

Autodom expects to see registrations of imports totaling about 280,000 units in the first half of '59 compared with 159,367 for the same period last year. In addition to the six top imports shown on the chart (Page 63), Hillman, Triumph, Vauxhall, and Volvo complete the top ten contenders. Their combined sales are taking a 15 per cent slice of the import pie.

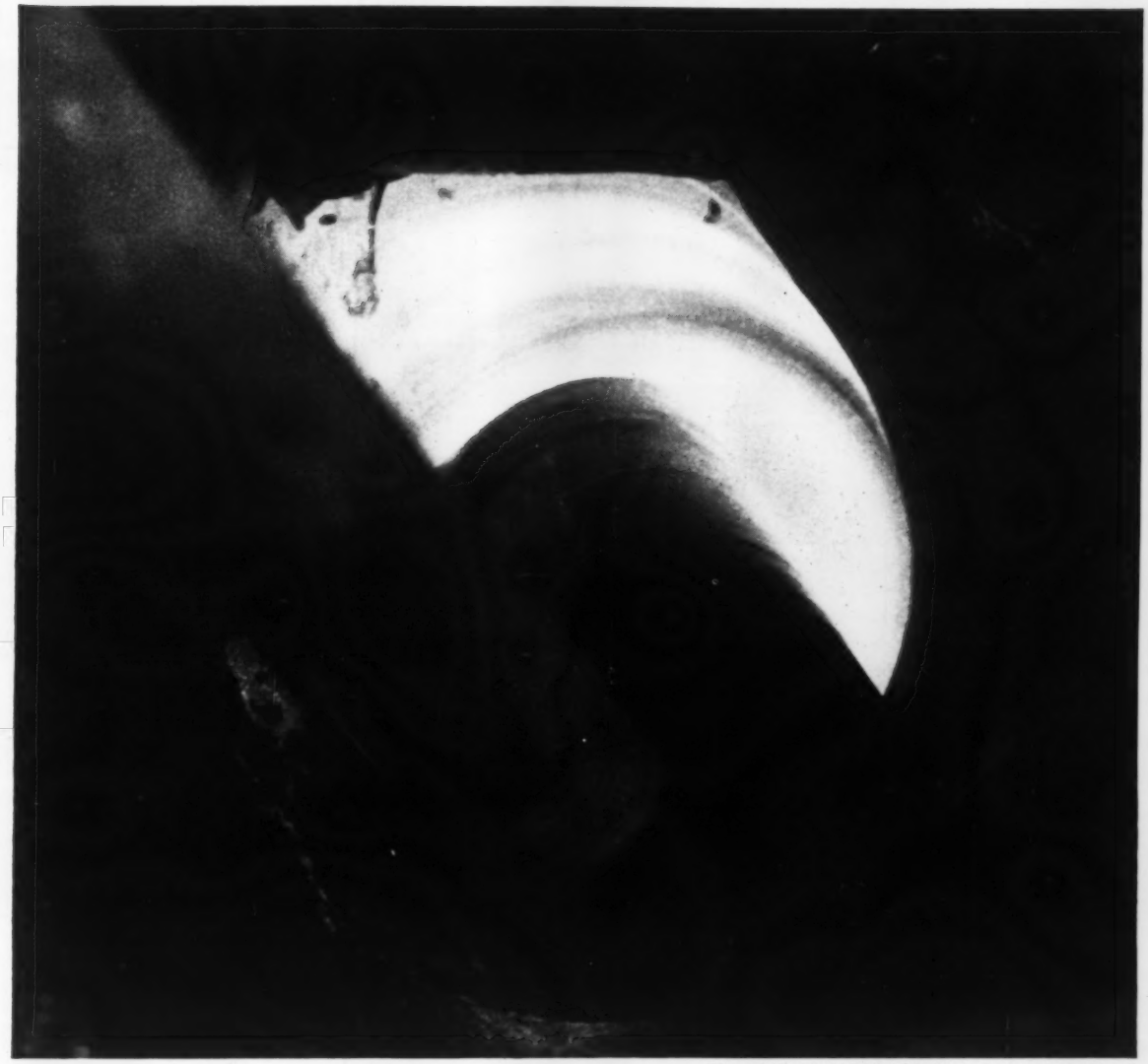
U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
5 Mo. Totals	2,725,968	1,904,902
June		337,446
July		321,017
August		180,447
September		130,460
October		261,701
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
May 23	133,568	86,082
May 30	117,372	66,844
June 6	125,186	73,696
June 13	127,029	78,163
June 20	130,504†	84,396
June 27	130,000*	92,277

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.



Photograph courtesy Ohio Seamless Tube Division of Copperweld Steel Company

Aristoloy uniform quality steel bars pay off on hot piercing operations

Few manufacturing operations match piercing of tube rounds as a severe test of quality. Rapid displacement of metal and immediate increase in temperature reveal internal defects... magnify the slightest surface imperfections.

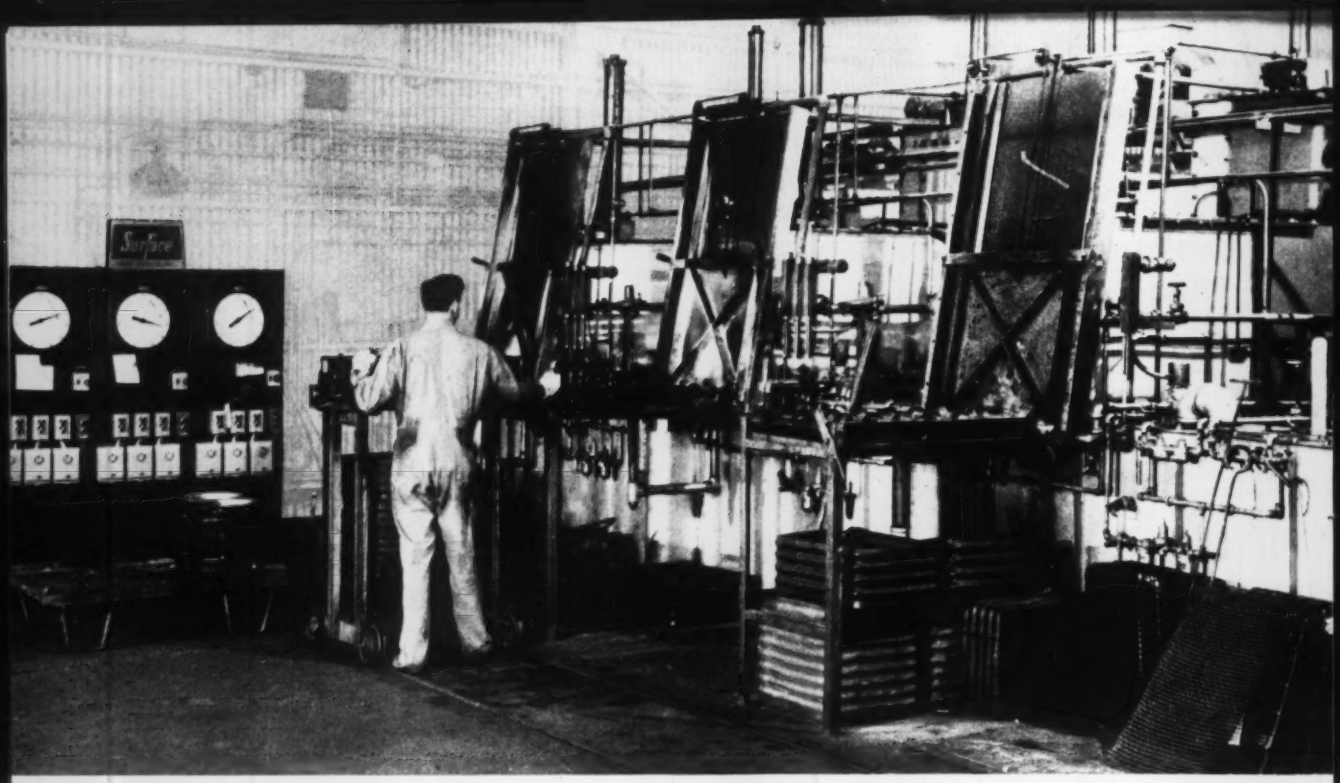
Copperweld's precise melting produces a prime ingot of uniform chemistry. Careful conditioning and rolling deliver bars that meet Aristoloy piercing quality specifications. Available in a full range of A.I.S.I. standard analyses.

For complete information about Aristoloy blooms, slabs, billets and bars, in carbon, alloy, stainless and leaded, call Copperweld in your nearest large city, or write for NEW PRODUCTS & FACILITIES CATALOG.

ARISTOLOY STEELS

COPPERWELD STEEL COMPANY

ARISTOLOY STEEL DIVISION • 4005 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.



23,000 HOURS!

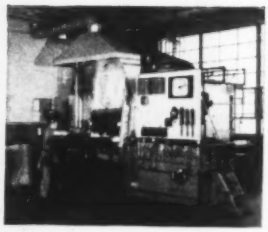
not one maintenance shutdown

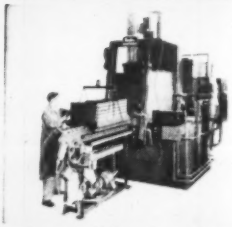
That surprising record of a ***Surface Allcase***® furnace was revealed during a recent survey of a large number of installations which had been operating over four years.

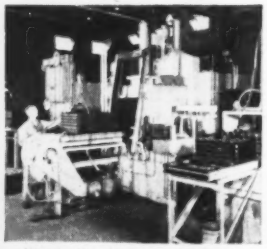
Other remarkable data on the average life of alloy steel parts in these furnaces:

Radiant tubes: 14,700 hours
Tube support brackets: 14,400 hours
Roller rails: 15,300 hours
Trays: 6,200 hours
Baskets: 7,800 hours

This record is convincing evidence that Surface quality keeps maintenance cost (frequently a major portion of operating expenses) to an absolute minimum. Write for Allcase Bulletin SC-174.







Illustrations shown are typical Allcase installations.

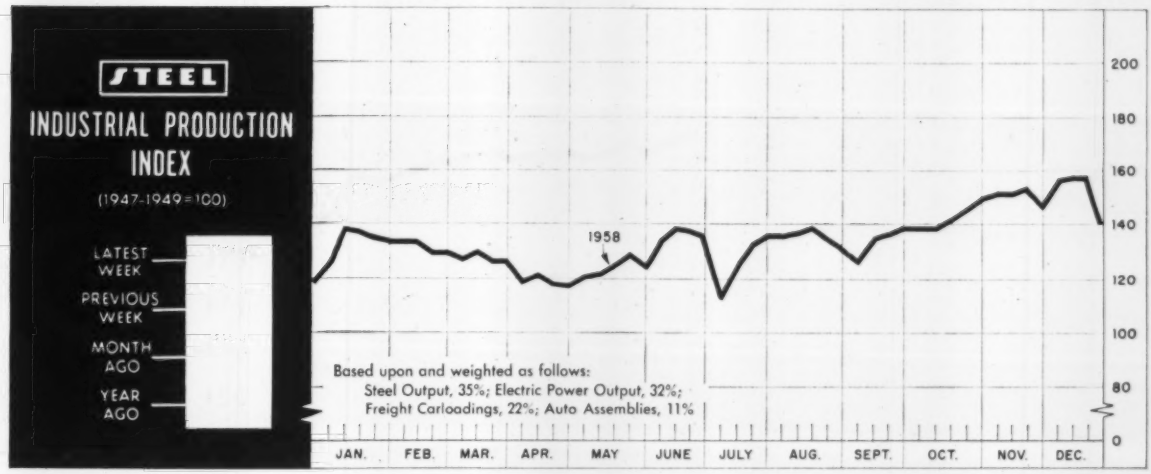
Surface®

wherever heat is used in industry

SURFACE COMBUSTION CORPORATION

2385 Dorr St., Toledo 1, Ohio

In Toronto: Surface Industrial Furnaces, Ltd.



*Week ended June 20.

Index Sets Last Record Until Fall

AFTER RISING to record levels for three weeks in a row, STEEL's industrial production index is about to begin the slide that may take it to its lowest point since mid-1956. Only the all-out efforts of steelmakers to produce and ship as much steel as possible before July 1 prevented the trend line from starting its descent during the latest period of record.

All four components of the index above contributed to the new high of 175 (1947-49=100) established by the preliminary reading for the week ended June 20. It followed readings of 174 and 172 for the two previous periods. Only a minor dip in the Memorial Day week interrupted a string of seven weeks in which the trend line equaled or set a record. At no other time in the history of the barometer has this occurred, indicating the strength of the breakthrough of industrial production into postrecovery territory.

• **Honeymoon Over**—While some of the components may continue to expand, steel production almost certainly will start to decline as the wage contract deadline approaches. In similar situations in the past, the steel industry has usually started to shut down 10 to 13 days prior to the deadline. However, during the week ended June 21, producers turned out 2,620,000 net tons of steel for ingots and castings, or about 92 per cent of capacity.

While they announced their intentions of holding to that level last week, it is doubtful that they did so. Unless some agreement is reached today or tomorrow (June 29 or 30), nearly 90 per cent of the mills will be shut down.

Producers are faced with a dilemma: They can't publicly announce a cutback, which could be interpreted as an admission that they will make no further effort to settle before July 1. And yet they can't take a chance on reaching agreement and keep the furnaces operating at near capacity. If there is a strike, such

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,627[1]	2,620	1,666
Electric Power Distributed (million kw-hr)	13,500[1]	13,503	11,941
Bituminous Coal Output (1,000 tons)	9,030[1]	8,525	8,255
Crude Oil Production (daily avg—1,000 bbl)	7,050[1]	7,010	6,345
Construction Volume (*ENR*—millions)	$546.1	$522.8	$429.9
Auto, Truck Output, U. S., Canada (*Ward's*)	168,839[1]	164,970	110,538
TRADE			
Freight Carloadings (1,000 Cars)	710[1]	709	628
Business Failures (Dun & Bradstreet)	295	314	254
Currency in Circulation (millions)[3]	$31,877	$31,803	$31,070
Dept. Store Sales (changes from year ago)[3]	+3%	+11%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$27,423	$23,100	$28,592
Federal Gross Debt (billions)	$286.3	$286.2	$275.7
Bond Volume, NYSE (millions)	$26.2	$30.9	$26.6
Stocks Sales, NYSE (thousands of shares)	13,125	15,468	13,732
Loans and Investments (billions)[4]	$94.7	$94.5	$93.5
U. S. Govt. Obligations Held (billions)[4]	$28.5	$28.5	$31.2
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	222.1	222.2	197.6
All Commodities[7]	119.4	119.4	119.0
Commodities Other than Farm & Foods[7]	127.9	127.9	125.2

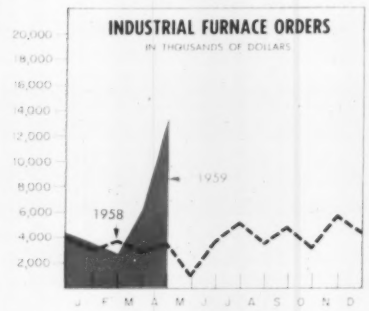
*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

TO
FIND
THE MAN
YOU NEED . . .

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

STEEL
The Metalworking Weekly

THE BUSINESS TREND



	1959	1958	1957
Jan.	3,518	3,047	8,775
Feb.	2,741	3,684	9,769
Mar.	6,146	2,871	10,485
Apr.	13,328	3,572	4,559
May	4,174	954	5,389
June	....	3,672	4,369
July	....	5,169	4,332
Aug.	....	3,533	3,924
Sept.	....	4,846	7,463
Oct.	....	3,105	3,674
Nov.	....	5,597	2,832
Dec.	....	4,284	3,992

Industrial Heating Equipment Assn. Inc.
Charts copyright, 1959, STEEL.

	1959	1958	1957	1956
Jan.	115.84	93.07	126.34	122.43
Feb.	124.77	93.49	139.29	129.56
Mar.	146.36	97.89	140.76	166.14
Apr.	147.28	122.36	132.67	145.20
May	....	118.04	157.95	155.53
June	....	131.15	121.57	189.13
July	....	134.34	128.31	165.50
Aug.	....	104.46	110.09	168.70
Sept.	....	85.41	116.79	130.35
Oct.	....	111.35	124.80	143.38
Nov.	....	110.88	87.80	138.50
Dec.	....	105.97	105.65	117.76
Avg	....	109.87	124.34	147.68

Material Handling Institute Inc.

action would result in severe damage to the equipment. It takes several days to bank furnaces. In addition, wildcat strikes are becoming more frequent. All in all, output last week probably did well to hit 2 million tons.

• **The Result**—In that case, you can expect the trend line to decline several points during the week ended June 27, with the dramatic plunge following in the next week. The steel situation will not be the only depressant. July 4, even though on a Saturday, will slash into the nation's production schedule. Another big cut will come from the drop in railroad freight shipments caused by the annual coal miners' vacation which started June 27 and will continue until July 11. Coal loadings amounted to over 121,000 cars in the latest week.

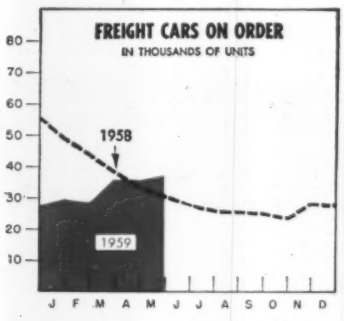
The other two elements in the index should do well for a couple of weeks after the Fourth. Auto and truck production is still close to the 160,000 unit a week rate and will remain there, except for the holidays, until minor changeovers begin in mid-July. With sales running at their best level since 1955, automakers are not inclined to slow down yet. Electricity production is running close to the all-time record of 13.554 billion kw-hr set in early January and should increase seasonally, steel strike or no.

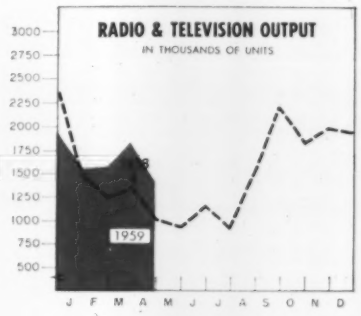
• **Record Safe**—Even if there is no steel strike, the record (175) will stand until the steel mills return to top-level production and the auto producers start production of 1960 models in the fall. Then the record will be no safer than its last four predecessors.

FRB and Utopia

The monthly report of the Federal Reserve Board indicates that we've never had it so good. In fact, the board's summary of business conditions for May reads like an economic Utopia.

"Expansion in industrial activity continued in May; employment increased further; and the decrease in unemployment was again considerably larger than seasonal. Consumer incomes and buying attained new highs, and business plans for plant and equipment outlays in 1959 were revised upward. Commercial bank loans and the seasonally adjusted money supply continued to increase. Security yields tended upward in May and early





	Awards		Backlogs (end of month)	
	1959	1958	1959	1958
Jan.	4,007	401	29,470	48,787
Feb.	1,806	287	28,789	43,750
Mar.	10,795	193	35,487	38,027
Apr.	3,736	278	35,479	32,908
May	5,253	1,372	36,869	30,386
June	....	317	.....	27,757
July	....	376	.....	25,994
Aug.	....	1,773	.....	25,611
Sept.	....	1,580	.....	24,982
Oct.	....	781	.....	23,670
Nov.	....	6,295	.....	27,962
Dec.	....	3,830	.....	27,596
Total	....	17,481		

American Railway Car Institute.

	Radio		Television	
	1959	1958	1959	1958
Jan.	1,125	1,026	437	434
Feb.	1,125	877	459	370
Mar.	1,348	931	494	417
Apr.	1,040	630	389	303
May	....	655	...	267
June	....	774	...	377
July	....	622	...	275
Aug.	....	1,029	...	507
Sept.	....	1,572	...	622
Oct.	....	1,322	...	496
Nov.	....	1,546	...	438
Dec.	....	1,526	...	415
Totals	....	12,510	...	4,921

Electronic Industries Association.

June. Wholesale prices of industrial commodities changed little."

Specifics: The FRB production index reached a record 152 (1947-49 = 100), a gain of 2 points over the revised figure for April. That is 20.6 per cent above the recession low of April, 1958. Every major segment of the economy contributed to the advance, with some of the biggest gains coming in the durable goods industries.

Employment in May rose to 66 million, a record for the month, while unemployment dropped to 3,389,000, the lowest figure since December, 1957. The biggest factor in the employment rise was the contraseasonal uptrend in factory employment, which reached 16.1 million last month.

A longer workweek (40.5 hours), more overtime (2.7 hours a week), and high wages ($2.23 an hour in manufacturing) pushed average weekly earnings of factory workers above the $90 mark for the first time. It helped personal income hit a record annual rate of $376 billion last month, $3 billion above the April rate. Cash dividend payments amounted to $318 million, bringing the 1959 total to $4.188 billion.

Relatively stable prices coupled with the increase in earnings gave consumers another boost in buying power. The government's consumer price index advanced slightly to 124 (1947-49 = 100) last month and is only 0.4 percentage point above the year-ago level. Wholesale prices backed off a bit to 119.8 (1947-49 = 100) from April's 120. A year ago, the index stood at 119.5.

Industrial Activity Up

Industry reports show why the economy is in such good condition.

Even though sales of industrial furnaces in May fell from the lofty height set in April, they still totaled $4,174,000, slightly above the comparable figure for 1958, reports the Industrial Heating Equipment Association Inc. The cumulative total for 1959 is 112 per cent ahead of the corresponding figure for last year. (See table, Page 68.)

Members of the Material Handling Institute Inc. report April bookings were up to 147.28 per cent of the 1954 average (see chart, Page 68), the highest since May, 1957.

Orders of freight cars last month advanced to 5253 as deliveries slipped a bit to 3358, says the American Railway Car Institute. The backlog climbed to the highest point in 19 months (see chart above).

Connections remain tight!

PITTSBURGH QUENCHED and TEMPERED CAP SCREWS

These screws stay on the job. The clamping force attained by these quenched and tempered screws is superior—once tightened to the prescribed tension, they remain tight. Pre-selected steel; clean, strong, unified threads; and controlled heating and cooling give factor of safety plus strength to every connection.

For vastly improved load-bearing ability, specify Pittsburgh quenched and tempered cap screws. VMA 6472

Other Pre-selected Performance Products

Contact our field representative or local distributor

SCREW AND BOLT CORPORATION OF AMERICA P O Box 1708 Pittsburgh 30 Pa

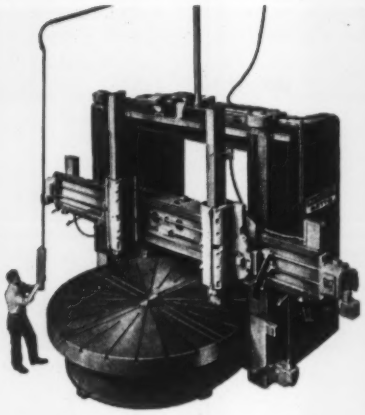
Formerly Pittsburgh Screw and Bolt Corporation

America's Most Complete Line of Industrial Fasteners

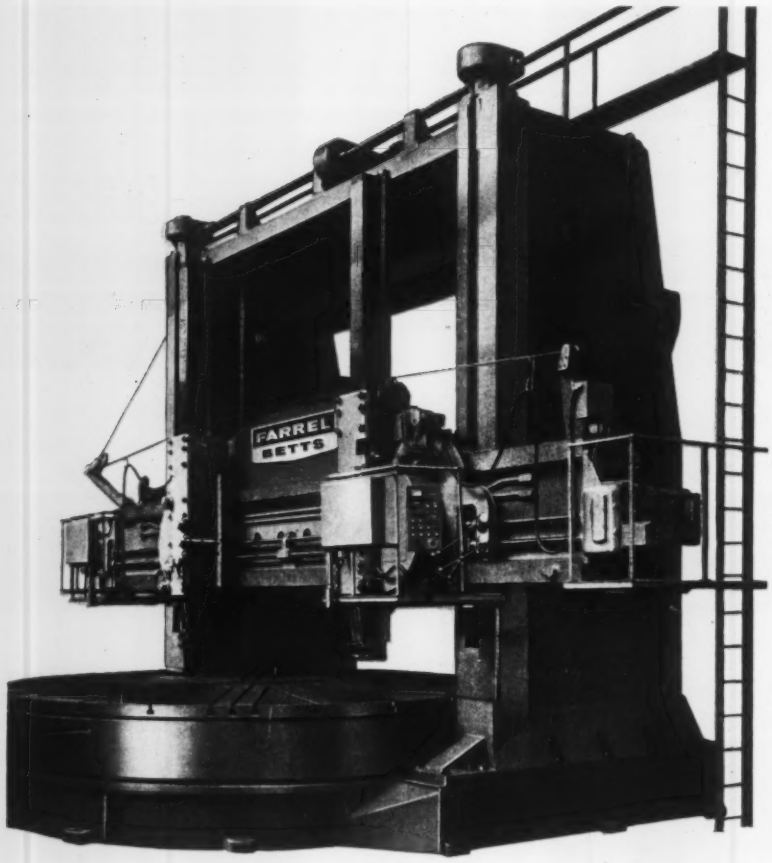
standard vertical boring mills from

100" to 504"

tailored to individual requirements



Accuracy plus convenience in a 12-foot mill.



Farrel-Betts 20-foot vertical boring mill.

When you select a vertical boring mill from industry's most complete range of sizes, you get the design features needed to meet today's most exacting production requirements.

The Farrel-Betts standard line gives you the latest designs in controls, drives, speed and feed ranges, arrangement of heads, and auxiliary equipment, including taper and tracer attachments, etc., to meet almost any production requirement. Furthermore, features such as antifriction-bearing tables and replaceable bronze liners for the steel rams assure the accuracy and rigidity necessary for finest results.

Contact Consolidated and see for yourself the many advantages of Farrel-Betts mills. Available in sizes from 100 inches to 42 feet and larger.

FARREL-BIRMINGHAM COMPANY, INC.
CONSOLIDATED MACHINE TOOL DIVISION
565 Blossom Road, Rochester 10, N. Y.
Telephone: BUtler 8-4600
Plants: Ansonia and Derby, Conn.,
Buffalo and Rochester, N. Y.

CM-42

FARREL BETTS®

WILLIAM G. BLESSING
Blaw-Knox purchasing dir.

WILLIAM C. RIDGE
Roebling exec. v. p.

ANDREW B. LOGAN
Towne Robinson Nut pres.

EDWIN E. CASPELL
AS&W-Donora Wks. gen. supt.

William G. Blessing, former purchasing agent, Foundry & Mill Machinery Group, **Blaw-Knox Co.,** Pittsburgh, was named director of purchases for the firm. Appointed assistant purchasing directors are **Bernard R. Lauer** and **Wayne Rawley Jr.** Also announced was consolidation of purchasing of the Aetna-Standard Div. into the Foundry & Mill Machinery Group, and appointment of **Cal R. Wood** as purchasing agent for the group.

William C. Ridge was appointed executive vice president, **John A. Roebling's Sons Corp.,** Trenton, N. J., subsidiary of Colorado Fuel & Iron Corp. Formerly vice president - production, he succeeds **Charles R. Tyson,** resigned.

Herman L. Koegel fills the new post of manager, Crane & Hoist Mechanical Engineering Dept., **Harnischfeger Corp.,** Milwaukee. This is a newly created department in its Industrial Div. He was chief engineer, crane and hoist development, and is succeeded by **Douglas E. Holt.**

Thomas Hollingsworth was appointed general sales manager, **Hubbard & Co.,** Chicago. He was director of marketing for Electrical Engineers Equipment Co., subsidiary.

Wilbert E. Stevenson, president and director of Machlett Laboratories Inc., subsidiary of **Raytheon Co.,** Waltham, Mass., was elected a vice president of Raytheon. Merger of Machlett into Raytheon became effective May 25.

Andrew B. Logan was elected president, **Towne Robinson Nut Co.,** Detroit. He was general manager.

C. H. Creasser was appointed vice president-manufacturing, **Walworth Co.,** New York. He was with Combustion Engineering Corp. **John Alico** was made director of engineering.

John A. Dooley fills the new post of assistant works manager, **Calumet Steel Div.,** Chicago Heights, Ill., Borg-Warner Corp. He was production manager in charge of production planning and scheduling.

Joseph Gorno was elected vice president, **Hancock Steel Co. Inc.,** Detroit.

Frick Steel Co., Bridgeville, Pa., appointed **Ray C. Smith** vice president-sales; **Joseph D. Johovic** as western Pennsylvania sales representative. Mr. Smith was Dayton, Ohio, sales manager for Latrobe Steel Co. Mr. Johovic was a metallurgist with Forge Heat Treat Div., Duff-Norton Co.

Willard J. Harper was named chief engineer, **Hanson - Van Winkle-Munning Co.,** Matawan, N. J. He was chief mechanical engineer. **David M. Roney Jr.** was made sales manager-Equipment Div.

Cornelius S. Kipfer was made superintendent of Central Shops, **Argonne National Laboratory,** Lemont, Ill. He succeeds **Herbert V. Ross,** who resigned to accept a position with Combustion Engineering Corp., New York.

Edwin E. Caspell was appointed general superintendent, Donora, Pa., Works, **American Steel & Wire Div.,** U. S. Steel Corp. He succeeds the late **U. F. Corsini.** Mr. Caspell was general superintendent of the New Haven, Conn., and Trenton, N. J., Works of AS&W, and is succeeded by **John J. Grimes Jr.,** who was works superintendent at New Haven.

Frank L. Wood was elected vice president-operations, **Inland Steel Products Co.,** Milwaukee, subsidiary of Inland Steel Co. He succeeds **Norman D. Rice,** resigned.

Emanuel Schugar, vice president-general manager, **Wales-Strippit Div.,** Akron, N. Y., **Houdaille Industries,** was appointed group vice president to head several of Houdaille's manufacturing units, with headquarters in Buffalo. **Russell A. Johnson,** general sales manager at Wales-Strippit, was made general manager of that division.

Louis T. Campbell III was made assistant to the vice president-engineering, **National Steel Corp.,** Pittsburgh. He was assistant chief engineer, Fairless Works, U. S. Steel Corp.

Harold A. Williamson was made plant manager at the Chicago factory of **Dahlstrom Machine Works Inc.**

Nelson C. Walker was made executive assistant to the president, **Green River Steel Corp.,** Owensboro, Ky., subsidiary of Jessop Steel Co. He was general manager,

JOHN I. TRIMBLE

JAMES W. ASHBY

Janitrol division managers

J. L. ASHBY

D. A. RHOADES

Kaiser management posts

Aetna Steel Products Co., Pottsville, Pa.

John I. **Trimble** and **James W. Ashby** were made general managers of **Janitrol** divisions of Surface Combustion Corp. Mr. Trimble will manage the Janitrol Heating & Air Conditioning Div.; Mr. Ashby the Janitrol Aircraft Div., both at Columbus, Ohio.

Howard W. Carlisle succeeds **E. D. Vancil**, retired, as manager of the Meta-Dynamics Div., **Cincinnati Milling Machine Co.** Mr. Carlisle joined the division in 1958. He was associated with various metalworking companies for more than 20 years in engineering, sales, and management.

Dr. William C. Knopf was named technical director, USI Technical Center, Pompano Beach, Fla., **U. S. Industries Inc.** The center was established for advanced work in detection systems, nuclear application, and other fields for the military, as well as long range product research and development projects for USI manufacturing divisions.

Lawrence R. Doty was made industrial sales promotion manager, **A. Schrader's Sons**, division of Scovill Mfg. Co. Inc., New York.

Ross C. Byers was made acting works manager, Evansville, Ind., plant, **Bucyrus-Erie Co.** He was general superintendent-manufacturing at the firm's Erie, Pa., plants.

Jack Harris, former chief engineer, was promoted to the new post of executive engineer at **Korfund Co. Inc.**, Long Island City, N. Y.

Lawrence Saper was appointed director of engineering, Eastern Div., **Acoustica Associates Inc.**, Plainview, N. Y. He was with Bogue Electric Mfg. Co. as assistant vice president and director of research and development.

E. J. **Cassella** was elected vice president-manufacturing, **Beaver Pipe Tools Inc.**, Warren, Ohio. He was factory manager.

Kaiser Industries Corp., Oakland, Calif., announces management changes of four of its principal companies: **J. L. Ashby**, president and chief executive officer, Kaiser Steel Corp.; **D. A. Rhoades**, president and chief executive officer, Kaiser Aluminum & Chemical Corp.; **S. A. Girard**, president and chief executive officer, Willys Motors Inc.; **W. A. Marsh**, president and chief executive officer, Permanente Cement Co. Each served as vice president-general manager of his respective organization. **Henry J. Kaiser Sr.**, former chairman and president of Kaiser Steel, Kaiser Aluminum, and Permanente Cement, and chairman of Willys Motors, assumes the new post of founder-chairman of each organization. Named chairman of each is **Edgar F. Kaiser**, former vice president of aluminum, steel, and cement. **E. E. Trefethen Jr.**, formerly executive vice president of each, assumes the new post of vice chairman of the boards. Messrs. Kaiser Sr., Edgar Kaiser, Trefethen Jr., and Henry Kaiser Jr. continue, respectively, as

HOWARD W. CARLISLE

Cincinnati Milling div. mgr.

DR. WILLIAM C. KNOPF

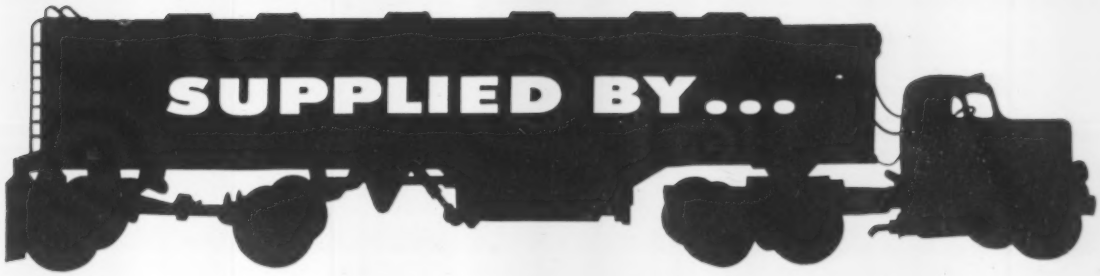
USI Tech. Center dir.

LAWRENCE SAPER

Acoustica div. engineer

E. J. CASSELLA

Beaver Pipe Tools v. p.



You get the fuel oil you want, when you want it!

An important part of the Allied success story is in our efficient storage-and-transport system. We use lake tanker, river barge, tank car and truck transport to deliver fuel oil exactly when you want it—in any quantity.

Our experienced team of sales and technical people are fuel oil specialists. You benefit from their specialized experience.

Allied serves the heart of Industrial America, from the Mississippi to the Alleghenies—from Alabama to Canada. In this area, we can meet any fuel oil requirement. Write, wire or phone today!

ALLIED
FUEL OIL
SPECIALISTS

ALLIED OIL COMPANY
Division of Ashland Oil & Refining Company
CLEVELAND 13, OHIO / PRospect 1-3400

E. A. SCHLATTER
Art Iron & Wire president

MITCHELL A. THOMPSON
Kaiser open hearth supt.

H. E. TEMPLE
Food Machinery eng.-dir.

JOHN MOXON
heads Carpenter Steel

EDWARD J. DWYER
Electric Storage Battery pres.

LOUIS C. KEMO
Wheeling-Benwood supt.

chairman, president, executive vice president, and vice president of the parent firm, Kaiser Industries Corp.

John Moxon was elected president, **Carpenter Steel Co.**, Reading, Pa. Former executive vice president, he now assumes responsibilities as chief executive officer. **Frank R. Palmer**, president since 1948, was elected chairman, a post vacant since 1956.

Edward J. Dwyer was elected president, **Electric Storage Battery Co.**, Philadelphia. He was vice president and secretary. He succeeds the late **Carl F. Norberg. Elmer B. Ott** was elected chairman. He was a vice president of the company and president of Ray-O-Vac Div. since its acquisition in 1957. **William P. Cairo** was elected secretary.

C. Philip Johnson, executive at the Chicago plant of **Interlake Iron Corp.**, was named assistant general works manager, Cleveland headquarters. He is succeeded as general superintendent, Chicago, by **J. B. Kaminski**, blast furnace superintendent at Toledo, Ohio. **William H. Weinberg** succeeds Mr. Kaminski.

Louis C. Kemo was named divisional superintendent-production at **Wheeling Steel Corp.'s** Benwood, W. Va., Works.

David Owens was made sales manager, **Pennsylvania Crusher Div.**, West Chester, Pa., Bath Iron Works.

William F. Humphrey, midwest district sales manager, **Hercules Motors Corp.**, Canton, Ohio, was promoted to director of sales.

L. A. Dunn was named general manager, **Buck Iron Co. Inc.**, Buck, Pa. He was manager of the Erie, Pa., foundries of General Electric Co. for 25 years.

George Harmon was made sales manager, **Airmatic Valve Inc.**, Cleveland.

Samuel W. Stewart was made director - engineering and research, **Gabriel Electronics Div.**, Gabriel Co., at Needham Heights, Mass. He was head of the Microwave Engineering Dept., Sperry Gyroscope Co.

E. A. Schlatter, executive vice president, was elected president and chief executive officer of **Art Iron & Wire Works Inc.**, Toledo, Ohio. He succeeds his father, **Godfrey Schlatter**, founder of the firm, who becomes chairman.

Mitchell A. Thompson was made superintendent, Open Hearth Dept., **Kaiser Steel Corp.**, Fontana, Calif. He was assistant superintendent. **William K. Dennison** was made mine superintendent in charge of Kaiser's coal mining operations at Raton, N. Mex.

H. E. Temple was appointed director of engineering, **Food Machinery Div.**, Saginaw, Mich., Baker Perkins Inc. Former director of research and development for the division, he succeeds **Hans H. Hennecke**, who assumes management of product diversification for the firm.

Harold E. Sullivan was named general manager, Building Products Div., **American Welding & Mfg. Co.**, Warren, Ohio. He was assistant general manager.

Edward L. Holbrook was made manager, Eastern Div., **Modernair Corp. Glen R. Pittman** was made general sales manager at the home office, San Leandro, Calif.

Robert Barnum was made Los Angeles district sales manager, **Flexonics Corp.**

John V. Drum was appointed marketing manager, Mechanical Goods Div., **United States Rubber Co.**, New York. He was sales vice president with Detroit Brass & Malleable Co.

Robert R. Pierce was named purchasing agent, **Stromberg-Carlson Div.**, San Diego, Calif., General Dynamics Corp. He was purchasing agent for Bill Jack Scientific Instruments at Solano Beach, Calif.

OBITUARIES...

Arthur A. Merry, 67, chief of advanced tool engineering, **Pratt & Whitney Aircraft Div.**, Hartford, Conn., United Aircraft Corp., died June 14.

Louis Botwinik, 61, president, **Botwinik Bros. Inc.**, New Haven, Conn., died June 14.

OLIVE HILL

HIAC-K

SUPERAC-K

50 YEARS EXPERIENCE STAND BEHIND

GREFCO'S "BIG 3" STOVE BRICK!

For 50 years, General Refractories blast furnace stove brick have met the continuously tougher demands of American steelmaking. Here are today's "Big 3" in the GREFCO stove brick line, each made from the finest raw materials, under rigid quality control:

OLIVE HILL *Stove Wall Brick and* OLIVE HILL *Stove Checkers:* Preferred in hundreds of blast furnace stoves where high duty standard or multihole designs are used. Literally "a benchmark of the industry."

HIAC-K *Stove Wall Brick and* HIAC-K *Stove Checkers:* These super duty brick, standard or multihole, are made from specially calcined high-purity Georgia Kaolin, to provide low porosity and high density and refractoriness against severe service conditions.

SUPERAC-K *Stove Wall Brick and* SUPERAC-K *Stove Checkers:* Designed to withstand the most extreme destructive conditions of modern blast furnace stoves, Superac-K are the latest improvements in high fired, superduty fireclay brick. Their exceptional purity, strength and refractoriness, coupled with unusually low porosity, make them highly resistant to prolonged temperature and alkali attack.

GREFCO manufactures a complete line of multihole and special stove checker designs in each of these leading brands. Your GREFCO representative welcomes the chance to talk to you about the particular GREFCO brick best suited to conditions in your blast furnace stoves. Call him.

GENERAL REFRACTORIES COMPANY

PHILADELPHIA 2, Pa.

A COMPLETE REFRACTORIES SERVICE

Metalworking Firms Expand To Meet Needs of 1960s

THE METALWORKING industry continues to expand its capacity. As pointed out in the June 15 issue of STEEL (p. 87), "company managers are looking ahead to the 1960s."

• **McLouth Steel Corp.**—The Trenton, Mich., firm will spend $11 million on an expansion program that is scheduled to be completed by June, 1960. Sinter capacity will be doubled by the installation of another sintering strand. Steel capacity will be increased by adding another 110 ton oxygen furnace. Another boiler plant will also be built.

• **Bethlehem Steel Co.**—A multimillion dollar oxygen building is planned for the Lackawanna, N. Y., mill. It would be used to produce oxygen for scarfing and possibly for metallurgical applications, including injection of oxygen into open hearths. Bethlehem's Lackawanna plant is using the oxygen injection method in three of its 35 open hearths.

• **Inland Steel Co.**—A two stand, 54 in. temper mill is part of new rolling facilities being constructed at Indiana Harbor, Ind. All static excitation and amplification, including 60 and 400 cycle amplifiers, will make possible rapid speed response in the 7000 fpm steel strip processing operation. Key electrical equipment for the mill is being furnished by Allis-Chalmers Mfg. Co., Milwaukee.

• **Inland Steel Container Co.**—This Inland Steel Co. division dedicated a $2,750,000 addition to its pail-making facilities in Jersey City, N. J. Comprising 78,000 sq ft, the new unit is geared to perform at a top speed of 2400 pails an hour.

Features of the new installation include a coil shearing operation which enables the company to shear to any size required to produce a container of a given capacity. It offers a distinct advantage over the procedure of processing steel purchased in bundles of flat sheets. A lithographing press provides a complete in-plant decorating service.

Development of a new material handling system in combination with a new centrifugal electrostatic paint and lining application for pail parts provides a high degree of control. The new process does not use air and eliminates dust, oil, and moisture. This results in a uniformity of coating not previous obtained, company officials say.

The Jersey City plant produces steel pails from 2 to 12 gallon capacity and carbon steel drums from 13 to 65 gallon capacity. Products also include stainless steel pails and drums, heavy duty ICC drums, and galvanized drums.

• **Chromium Mining & Smelting Corp.**—Capital expenditures of about $2 million have been approved for the corporation and subsidiary companies for the fiscal year ending Apr. 30, 1960. More than half of that amount will be spent at the firm's smelter plant at Memphis, Tenn., where an open arc tilting furnace will be installed to augment production capacity and enable the firm to offer all grades of standard ferrochrome.

Major improvements will also be made at the Riverdale, Ill., plant to boost capacity for manufacturing exothermic products. The company will take an initial step in planned expansion of its Canadian plant by making production facilities at Beauharnois, Que., more flexible.

Mirro Buys Mill Equipment

Dravo Corp., Pittsburgh, has been awarded a contract for eight mill lubrication and coolant systems to be installed at a new rolling mill plant of Mirro Aluminum Co., Manitowoc, Wis. The systems will be installed on three Loewy-Hydropress rolling mills, a two high reversing mill, a four high nonreversing cold mill, and a Hydromil for high speed production of aluminum foil. The Loewy Hydropress Div., Baldwin-Lima-Hamilton Corp., New York, will design and build the mills. The motor and motor-generator set for the hot mill and cold mill will be supplied by Elliott Co., Ridgway, Pa., the foil mill by Reliance Electric & Engineering Co., Cleveland.

Armco Subsidiary Builds

Armco Drainage & Metal Products Inc., subsidiary of Armco Steel Corp., Middletown, Ohio, is constructing an office building to house its headquarters staff in that city. A building to house a testing laboratory and exhibit hall and a building for new offices of the Central Div. will be built later on the same site. Total cost of the three buildings: $750,000.

Cutler-Hammer Buys Plant

Cutler-Hammer Inc., Milwaukee, purchased a 493,000 sq ft plant at Deer Park, N. Y., from Fairchild Engine & Aircraft Corp. It will be used to consolidate operations of its Airborne Instruments Laboratory, now in four Long Island communities. The C-H division specializes in electronic research, development, and manufacturing. Certain technical departments are moving into a 157,000 sq ft structure being completed at Melville, N. Y.

Sells Milwaukee Plant

Cleaver-Brooks Co., manufacturer of packaged boilers, sold about 95,000 sq ft of its Milwaukee plant to American Motors Corp., Detroit. Cleaver-Brooks Co.'s administrative, sales, and engineering offices and adjacent properties on N. Richards Street are not included in the sale. The firm is retaining (via lease) the principal production building and general office area for continued operation.

Barry Controls Expanding

Barry Controls Inc., Watertown, Mass., plans to expand its plant in that city—20 per cent in floor space and 40 per cent in production facilities. The firm makes shock and vibration controls and test equipment.

Century Display Organized

Caspers Tin Plate Co. sold substantially all assets of its Century Display & Mfg. Div. to Century Display Mfg. Corp., a new corporation wholly unrelated to Caspers. Century will continue to operate in the building owned by Caspers at 4600 S. Kolin Ave., Chicago, Ill., until another location can be obtained. Caspers Tin Plate coats and lithographs metal containers, closures, advertising displays, and novelties. Century produces point of purchase display and other metal products.

AMF Forms New Division

American Machine & Foundry Co., New York, has changed the status of Potter & Brumfield Inc., Princeton, Ind., from a subsidiary to a division. Richard M. Brumfield has been named group executive of the AMF Electrical Products Group.

Installs Stretch Former

A 93 ton machine that stretches thin but tough stainless steel sheets into skins for the Atlas intercontinental missile has been put into operation at the San Diego, Calif., plant of Convair Div., General Dynamics Corp. The radial stretch former was manufactured by Cyril Bath Co., Solon, Ohio.

Wall Tube Buys Building

Wall Tube & Metal Products Co., Newport, Tenn., acquired a second factory building, bringing its manufacturing area to 141,000 sq ft. This is part of an over-all program of expanding facilities, including equipment.

ASSOCIATIONS

Fluid Controls Institute Inc., New York, elected these officers: President, J. R. Lawler Jr., Lawler Automatic Controls Inc., Mt. Vernon, N. Y.; first vice president, Fred Weldon, General Controls Co., Los Angeles; second vice president, Robert McCormick, Automatic Switch Co., Florham Park, N. J.; treasurer, Paul Rogers Jr., Skinner Chuck Co., New Britain, Conn.; corporate secretary, E. A. Bianchi, Mason-Neilan Div., Worthington Corp., Harrison, N. J.; and executive secretary, E. R. Rath.

Wire Reinforcement Institute, Washington, elected these officers: President, Warren D. Dreher, Colorado Fuel & Iron Corp., Denver; and vice president, Bruce D. Bennett, American Steel & Wire Div., U. S. Steel Corp., Cleveland. Frank B. Brown is managing director.

Resistance Welding Alloy Association, Philadelphia, elected these officers: President, James C. Cox, S-M-S Corp., Detroit; and vice president, H. A. Mullen, Ampco Metal Inc., Milwaukee.

CONSOLIDATIONS

American Steel Foundries, Chicago, purchased **South Bend Lathe Works**, South Bend, Ind., and will operate the property under the name of South Bend Lathe Inc. Russel E. Frushour will continue as president and chief executive officer of the subsidiary.

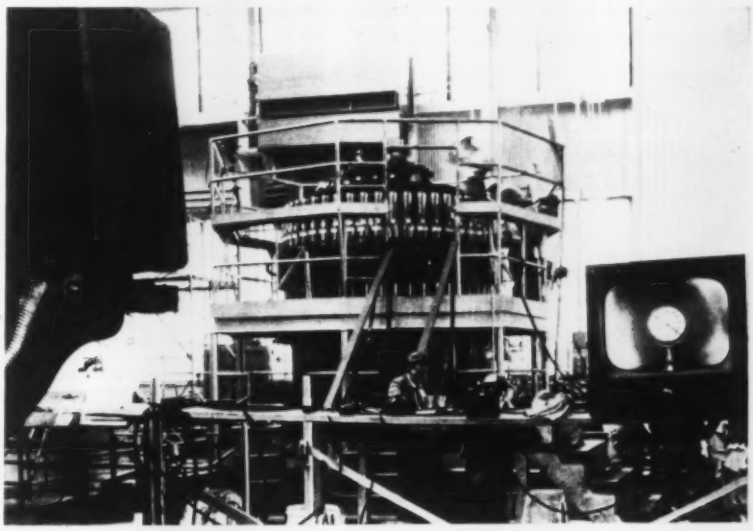
No-Sag Spring Co., Detroit, purchased **Sterling Wire Products Co.**, Philadelphia, manufacturer of cut and formed wire products for the furniture industry and concertina barbed wire.

Comptometer Corp., Chicago, purchased **Radiation Electronics Corp.**, Skokie, Ill., maker of infrared detectors, instruments for remote temperature measurement, thermal imaging devices, and high speed infrared scanning units.

NEW PLANTS

Carrick Products Co., Royal Oak, Mich., plans to move to its new $600,000 manufacturing plant at Greenville, Miss., this fall. The company makes auto moldings and stampings.

Belond Industries Inc., Culver City, Calif., is building a manufacturing and warehousing plant at Torrance, Calif. The 100,000 sq ft facility will house equipment to convert coils of steel into the widths needed to roll the various tube sizes produced by Belond. Two tube mills with a size range of 5/8 in. to 4.5 in. OD will produce rounds, squares, and shapes. Automatic cutting and deburring equipment will be included to handle the extended size range. Tube bending and fabricating services will be available.



THIS 105 TON STEEL VESSEL will become the "atomic furnace" of the **N. S. Savannah**, world's first nuclear powered ship. Completed by Babcock & Wilcox Co., Barberton, Ohio, the vessel has undergone more than 2500 quality control inspections and tests. It is 6½ in. thick, 28 ft tall, and 9 ft in diameter

The best features of modern bearing design — combined and refined in

Spherical

ROLLER BEARING PILLOW BLOCKS BY LINK-BELT

MAXIMUM SIZE ROLLERS

HIGH, HEAVY INNER RACE FLANGES

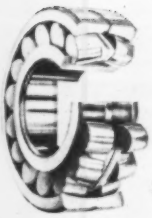
CENTRIFUGALLY CAST BRONZE RETAINERS

Big, mirror-smooth, convex rollers . . . hefty inner race flanges . . . centrifugally cast bronze, precision-machined retainers. They're industry's *preferred* bearing features. And they're *all* found in Link-Belt's new spherical roller bearing . . . compactly combined in an exceptionally durable two-piece housing.

These self-aligning roller bearing pillow blocks take misalignment in stride—adjust immediately in any direction while maintaining full load capacity. Two types of shaft mountings facilitate installation . . . adapter mounting for commercial shafting and direct shaft mounting for shafting ground to recommended tolerances. And Link-Belt's rugged steel multi-labyrinth or dacron-contact seals lock out dirt, lock in lubricant.

For details, call your Link-Belt office or authorized stock-carrying distributor, and ask for new 70-page Book 2760. Look under BEARINGS in the yellow pages of your phone book.

Series 6800, 6900, 7800, 7900 roller bearing pillow blocks have spherical roller bearings with internationally standardized boundary dimensions.



LINK-BELT

SELF-ALIGNING BALL AND ROLLER BEARINGS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15,161

Technical Outlook

June 29, 1959

MECHANICAL PLATING TO FORE—Protective metal coatings on small steel and powdered metal parts are applied mechanically with a new plating system developed by Minnesota Mining & Mfg. Co., St. Paul. Advantages claimed: Low cost, high production; the process doesn't embrittle high strength steels, and it works well on porous surfaces.

FASTER FERROCHROME—A low carbon ferrochrome that dissolves faster in stainless steel baths is announced by Union Carbide Metals Co., New York, a division of Union Carbide Corp. It's heavy enough to penetrate slag, preventing nitrogen pickup but light enough to remain suspended in the bath while it's dissolving. In a field test, 6000 lb of the alloy dissolved in a 70 ton stainless heat in 10 minutes vs. 25 minutes for another chromium alloy.

CHEMICAL INHIBITS CORROSION—Pickling baths can be treated with a new inhibitor (made from a fatty nitrogen) to reduce corrosion of stainless 316 and 420, Monel, bronze, and mild steel, says Chemical Div., Armour & Co., Chicago.

HIGH SPEED WEIGHING— Radioactive gages have been designed to weigh railroad cars moving past a check point at 30 mph, says Dr. Paul C. Aebersold, director of isotopes development, Atomic Energy Commission. The system is still being developed, he says.

EASES STAINLESS DRAWING— Molybdenum disulfide improves the drawing characteristics of 430 stainless, says Indiana Steel & Wire Co. Inc., Muncie, Ind. It is said to be superior to lead or metallic soaps.

THERMOELECTRIC POWER— A 40 lb device about the size of a medicine ball converts heat from a gas flame into about 100 watts of electricity about three times more efficiently than previous models, says Westinghouse Electric Corp., Pittsburgh. Developed for the Air Research & Development Command, Wright-Patterson Air Force Base, Ohio, its chief use will be remote power for electronic devices which cannot be serviced regularly. An advanced version is about ready for use with nuclear fuels.

EAR BUSTER—A new way to project sound already has resulted in more efficient public address systems. The Stanford Airstream Modulator modifies a moving stream of air (like that from a siren, for example) with voice pulses. Throwing power is several times greater than that of conventional loudspeakers, says Stanford Research Institute, Menlo Park, Calif.

MEASURING METAL STRENGTH— Regular tests for the high temperature strength of metals takes 100 to 1000 hours. A new method based on the equicohesive point of fracture takes considerably less time, says Battelle Memorial Institute, Columbus, Ohio.

ALUMINUM BEARINGS— Beginning this week, an aluminum-tin alloy gets a full scale field test on 100 railroad cars to find out whether it can solve the hot box problem. Lab tests have been promising, says Alcoa, Pittsburgh.

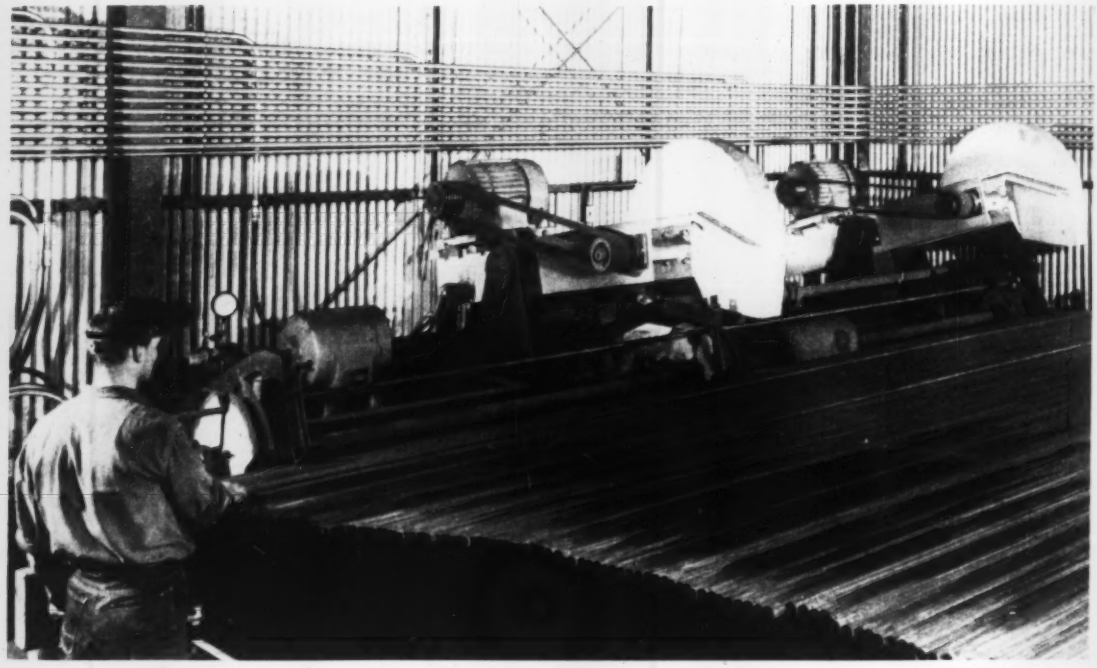
NEW METALS RESEARCH— Pressures of more than 3 million psi are being used by Battelle Memorial Institute, Columbus, Ohio, to make metals into new microstructures with unusual properties. The method is expected to produce metals with increased densities, improved crystal symmetry, and better mechanical properties.

CHAIN DRIVE LIVES LONGER— Oil impregnated, sintered steel bushings are the secret to lifetime lubrication and a fivefold increase in service life, says Whitney Chain Co., a subsidiary of Foote Bros. Gear & Machine Corp., Hartford, Conn.

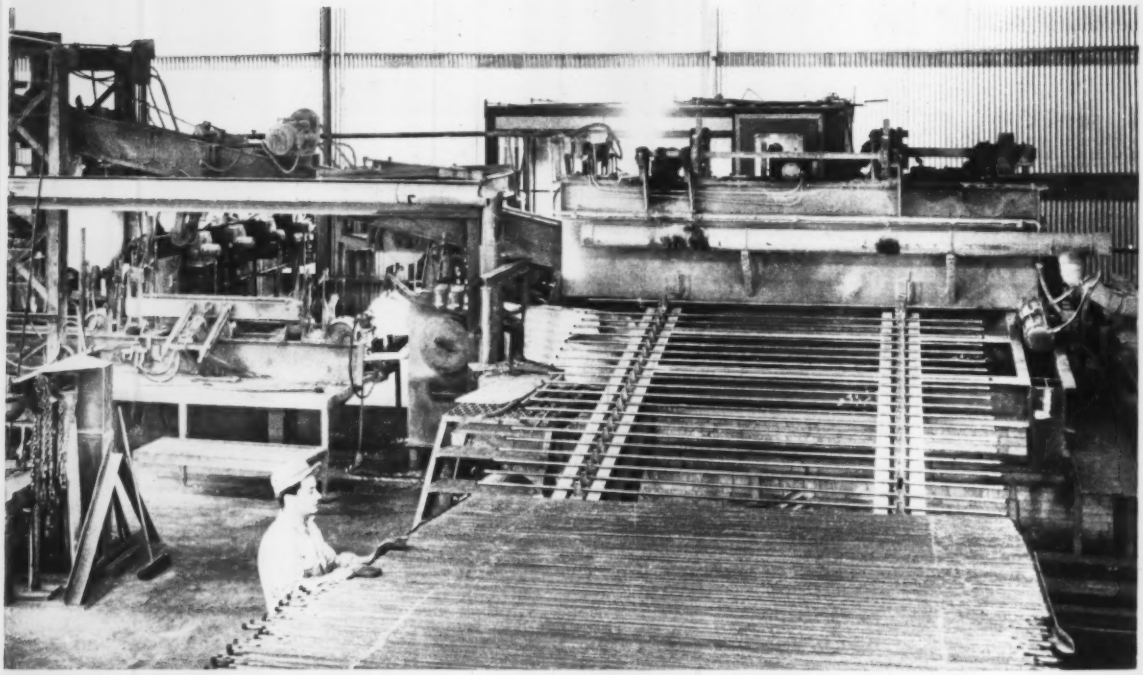
Metalworking Outlook—Page 37

Market Outlook—Page 109

Automation Speeds Galvanizing Process



1 Automatic, two bladed saw cuts conduit into two, 10 ft lengths and trims excess from one end. The pipe is then carried by conveyor to a threading machine. After threading, it's cleaned in a pickling tank and fed into the galvanizing machine



2 Raw pipe enters the automated hot dip galvanizing machine, where notched wheels carry it through a bath of molten zinc. As the pipe leaves the bath on magnetic rolls, steam and compressed air maintain an even coating on the inner and outer surfaces

Machines tailored to jobs and more efficient material handling helped this maker of conduit improve product quality and increase output

LOOK for increased use of automatic machines and equipment in hot-dip galvanizing. Here's why: Automation can boost output, improve product quality, and cut production costs. Integrated, straight line production equipment, mechanized and automated wherever possible, helped Pittsburgh Standard Conduit Co. increase galvanized conduit output more than 25 per cent at its new plant in Verona, Pa.

• Conduit is handled automatically, from raw pipe storage to the shipping area.

A conveyor carries pipe from outside storage to a hydraulically operated saw, where it's cut into 10 ft sections. Another conveyor feeds conduit into a machine that threads both ends at the same time.

An overhead crane carries bundled conduit to pickling tanks for removal of rust and other surface impurities. The pipe is then dipped in a preflux of zinc-ammonium chlorate, and carried by chain conveyor to the galvanizing machine.

• The galvanizing unit, installed by company personnel, is operated by one man. It handles more than 18 sections of conduit per minute.

The unit galvanizes pipe to gage, after it's threaded. It was designed by James M. Young, vice president, engineering design and production.

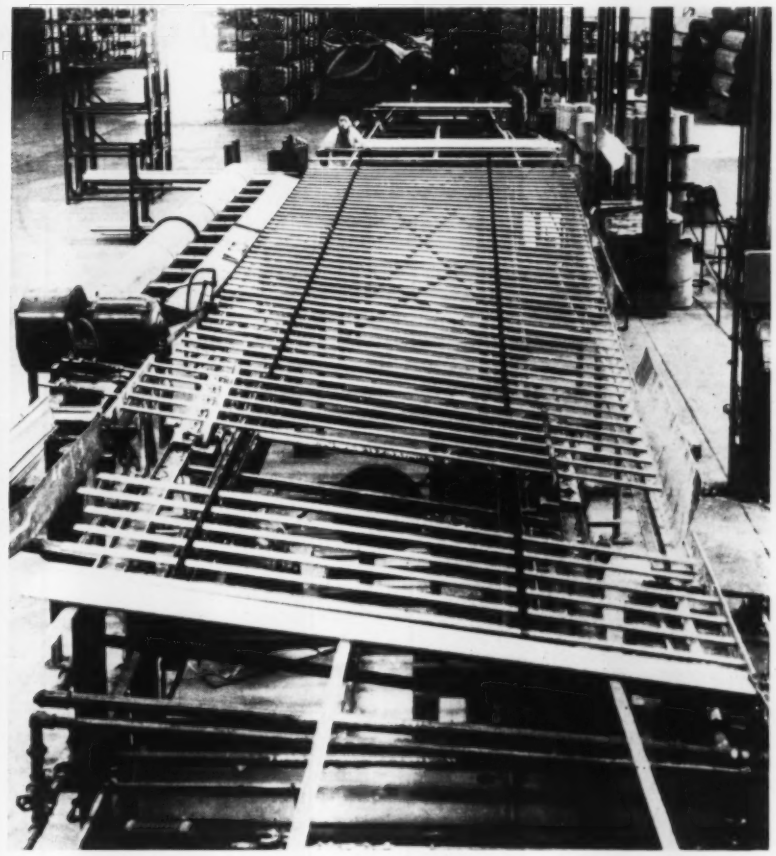
Conduit is automatically immersed in molten zinc, and taken from the bath on magnetic rolls. Steam and compressed air remove excess zinc, insuring a uniform coating on threaded ends.

Conduit then moves by conveyor to a quench tank and a chromic acid bath. Zinc chromate, formed on the inner and outer walls of the pipe, gives it better salt spray resistance.

After pipe is rinsed and dried, it is taken by conveyor through an inspection station, where it's labeled automatically. A coupling is put on one end; the other is protected by a plastic cover, color coded to indicate size.

Pipe couplings are galvanized by an electroplating process, in an automated barrel plating unit. Thin walled tubing is galvanized by an electroyltic process on the outside and lacquered on the inside.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

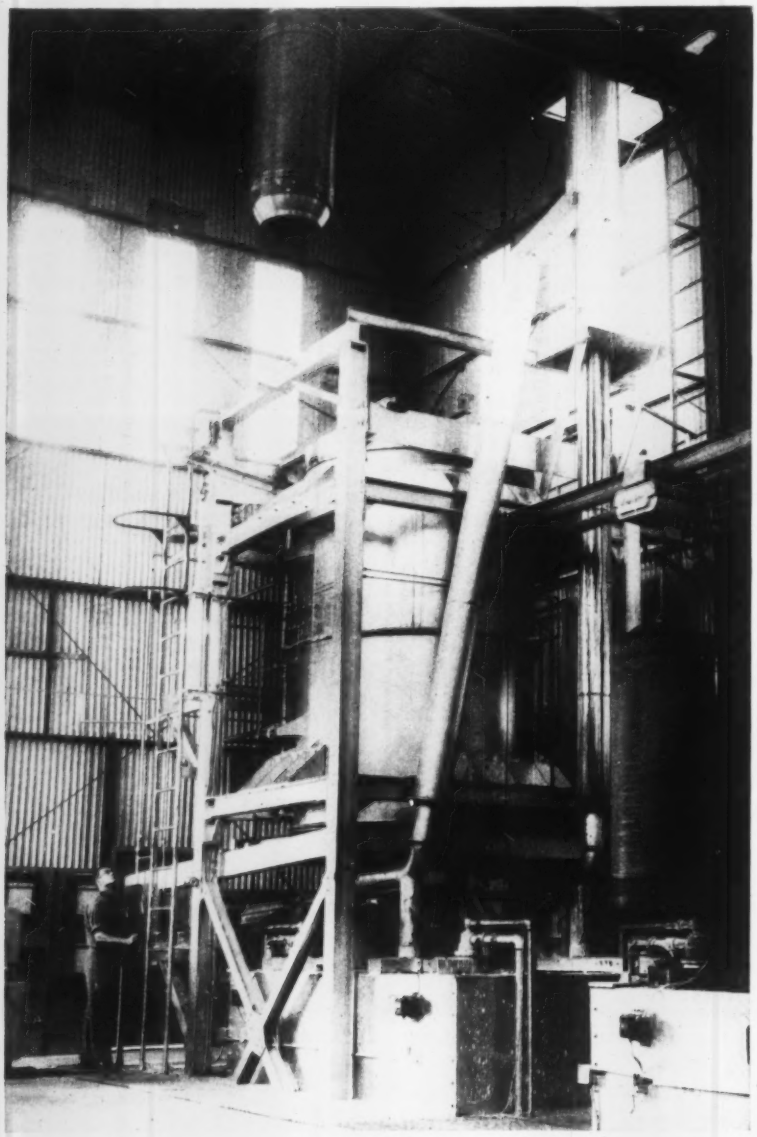


3 Galvanized conduit and electrical metallic tubing are inspected, then labeled and bundled automatically. Thin walled tubing is lacquered inside (the outside is galvanized electrolytically)

Barrel plating unit galvanizes conduit couplings up to 2½ in. in diameter by an electroplating process

Luminous Wall Furnace Slashes Heat Treat Costs, Boosts Quality

Rationed heat system and carbon potential process at a Texas company permit controlled heating and prevent scale. Below, an operator maneuvers a 7 ft long, fixtured rocket engine case on an overhead track to lower it into the furnace. A second case (lower right) is being transferred to a salt bath tempering tank after quenching in the salt bath below the vertical furnace



DRASTICALLY reduced heating cycle times and lower fuel costs are the benefits you can expect from the luminous wall furnace, a recent development of the A. F. Holden Co., Detroit.

Useful over a wide heating range —400 to 2300° F—the radiation heating unit is particularly applicable in areas where speed and uniformity of heating are important.

It's being used for scalefree heating of production parts, localized annealing of tube assemblies, hot forming of stainless and carbon tubes, enameling aluminum and steel, and brazing of stainless and aluminum assemblies.

At Intercontinental Mfg. Co., Garland, Tex., a luminous wall furnace is being used to stress relieve and heat treat a missile case fabricated from chrome-molybdenum steels.

The heat treat cycle is about an hour, much less than the time required in other methods of heating. Labor costs are less than originally anticipated, and the reject rate is less than 2 per cent. Fuel costs are 30 per cent less than with conventional heat treat furnaces, says the company.

• Heat treat requirements for the part are severe.

The rocket engine cases for the Army's Nike-Hercules are 84 in. long and 22 in. in diameter. The tube section of the case is 4130 steel. The forward head assembly and afterdome unit are fabricated from 4130 type steels (carbon contents vary) with wall thicknesses varying from 0.125 to 1.50 in.

There can be no distortion or detrimental change in physical and mechanical properties of the parts. There can be no scale and only minimum carbon deposits.

• The heat treat setup consists of a vertical, luminous wall, high heat

furnace, a salt bath quench, and a salt bath tempering furnace. All equipment was built by Holden Co.

After the engine case assembly is welded into a single unit, it's top loaded into the cylindrical luminous wall furnace. The furnace is lined with a porous refractory through which a gas-air mixture is passed and ignited on the inside surface. Heat is transferred to the part in the form of infrared radiation within a heating area 4½ ft in diameter and 10 ft high.

One of the important characteristics of the furnace is its capacity for rapid heating and cooling. (A 2 in. iron bar, 6 in. long, can be heated from room temperature to 2000° F in less than 20 minutes and cooled back down to 1000° F in 16 minutes while in the furnace.) The porous furnace lining absorbs the radiation from the gas flame and is heated rapidly by conduction and convection from the same flame.

At Intercontinental, the missile cases are preheated and weldments stress relieved at 1000 or 1300° F. They are austenitized at 1600° F.

• The furnace is a two-zone unit with dwell time at each heat level controlled by preset timers.

Use of the temperature plateaus provides uniform heat absorption through the varying wall thicknesses of the case. Holden calls the method its rationed heat energy system. It permits Intercontinental to plan process cycles and to control temperature differentials to varying metal thicknesses. Temperatures below the austenitizing level can be selected at will.

Because the processed cases must have no decarburization and minimum scale, a supporting atmosphere is injected under pressure during the high heat phase. Called the Holden carbon potential system, it is co-ordinated with the furnace operation and controls decarburization and scale formation on steels with 0.20 to 1.00 carbon content.

• After the high heat cycle, parts are lowered through the furnace and quenched in a salt bath for 15 minutes at 400° F.

Then they are conveyed to a salt bath tempering furnace and held for 60 minutes at 800° F. Both tanks contain the same kind of salt to avoid contamination.

E. P. Hancock, Intercontinental's engineering and manufacturing vice president, says the controlled heating and rapid quench using salt give exceptionally uniform properties to the missile case. "In some instances, it's necessary to stress relieve welded sections by heating them to about 1300° F for 30 minutes. This can be done quickly because the luminous wall furnace comes up to temperature in less than 30 seconds. It will cool to ambient temperature in 15 minutes with the doors open," he adds.

Because of that flexibility, Mr. Hancock says his firm has been able to intermingle full heat treat, normalizing, and stress relieving operations at will with a minimum of lost time.

The missile cases show as little as 0.015 in. change in diameter after heating.

202 Stainless Machines Better with Sulfur Addition

Machinability of 202 stainless steels is improved by adding 0.07 to 0.21 per cent sulfur, says Union Carbide Metals Co., a division of Union Carbide Corp., New York.

The company used drill penetration and lathe machining tests to evaluate the material. Standard cutting tool bits were used.

The sulfur made little difference in hot ductility at 2200 and 2400° F. There was no noticeable loss in stain resistance in a 20 per cent salt spray atmosphere.

Type 202 has been a standard stainless steel less than two years. It is an austenitic, high-manganese, low-nickel type.

A full range of mill forms, including rod and bar stock, are available.

GATELESS WONDER solves the problem of access between areas like this where ordinary gates aren't feasible. The opening is made by telescoping one pipe into another through cast aluminum fittings which eliminate the need for welding or threading. Sections are removed from floor fittings by loosening Allen-type screws. The screws also permit replacement of individual pipes

Hot Mill Water Reclamation Holds Use to Well Capacity

Using city water to supplement the supply would boost cost 14 times. Processing river water would double costs. The recirculation system removes oil, sludge, and scale

RECIRCULATION of cleaned process water is saving dollars at Carpenter Steel Co.'s hot rolling mill, Reading, Pa., by keeping water demands within capacity of the mill's wells.

Augmenting the well supply with city water would boost cost 14 times. Processing river water would double costs.

• Cleaning and re-using the well water conserves the supply, prevents stream pollution, ends clogged sewers, and reduces labor necessary to remove mill scale.

Large quantities of water are used for high pressure descaling in the two high reversing mill, and in the door cooling systems of the billet heating furnaces.

In an average month, the recirculation system is in operation for about 500 hours. Three pumps move about 2100 gpm.

• About 8000 to 20,000 gallons of water are circulated for each ton of specialty steel produced. Average output: 150 tons a day.

Water consumption is low: Only 101 gallons of water per ton of steel rolled. About 82,000 gallons per week are required from the wells.

Average monthly operating cost is about $1300.

It cost about $137,000 to install the system which has two catch basins, three sedimentation basins with equipment for removing solids, trenches, and a pumping system for forced circulation.

• Well water is pumped into a 200,000 gallon makeup tower and released as required into three outdoor settling basins.

From there it moves into the recirculating system.

Used water flows through trenches below the mill stands to a central, subterranean catch basin. Large solids are collected here by a bucket and screen system which is cleaned periodically. Smaller particles pass through, leaving the mill through a main pipeline.

Flight type scale conveyors inside the mill below the 18 and 20 in. stands minimize cleaning of the central catch basin. Those conveyors carry away from the main drainage system the largest pieces of scale encountered in the mill operation. The solids are deposited in buckets behind the stands and removed periodically by crane. All water is returned to the sedimentation basins.

• The three basins handle 13,000 gpm.

They are 69 ft long, 13½ ft wide, and 12½ ft deep. Water depth is 11 ft 9 in. The mill effluent can be channeled into any one of the three basins to eliminate overloads.

Scale and sludge settle to the bottom. Flight type conveyors drag the settled solids along the bottom of each tank, and up an incline at one end. A mechanical flight wiper at the end of the incline discharges the scale for easy removal by wheelbarrow. The scale is used for fill.

The water passes over a weir in each basin. A scum gutter removes the oil from the surface, allowing the clean water to pass over the top of the weir and return to the plant lines.

Scale and sludge are removed from settling basins by a flight type conveyor

You Can Use Malleable Iron Castings for 1200° F Service

Research on ferritic and pearlitic types casts new light on these materials. Stress-rupture strength at 800° F is equal or superior to that of other ferritic cast materials. At 1000 and 1200° F, their strength is adequate for many uses

YOU CAN use malleable iron for valves, fittings, pressure vessels, flanges, and other parts in elevated temperature service, says Hans J. Heine, technical director of the Malleable Founders' Society, Cleveland.

Research proves that malleable irons have exceptionally good physical and mechanical properties up to 1200° F. Both ferritic and pearlitic types have been tested up to 2300 hours. The research, which has been going on since April, 1955, was done for the society by Purdue University.

• Many new applications are indicated by research results.

Mr. Heine points out that many parts now being made from other materials can be converted to malleable castings with resulting economy, quality, and safety, pending approval by specification-writing bodies.

• Data for pearlitic malleable irons also promise excellent performance.

Pearlitic malleables appear equal or superior to unalloyed cast irons with which they are sometimes compared, and equal or superior in serviceability to a number of alloyed materials, including nodular iron.

Equally important to the engineer and ultimately to the consumer is the fact that the stress-rupture curves for malleable irons do not reach a point at which they break sharply as do similar curves for other commonly used materials.

Instead, they continue at a uniformly slight rate of decline beyond the breaks in the curves for some other materials. To date, high and low carbon ferritic malleable and ASTM Grade 60003 pearlitic malleable have been tested. Specimens included samples from five producers of malleable castings. Research is continuing at Purdue University with other grades of pearlitic malleable.

• Tensile strength of malleable shows little change with temperature below 700° F.

The data obtained indicate a high level of stress versus rupture time, equal or superior to other ferritic cast materials for which data are available, particularly at 800° F. The strength of malleable at 1000 and 1200° F is adequate for many uses, says Mr. Heine.

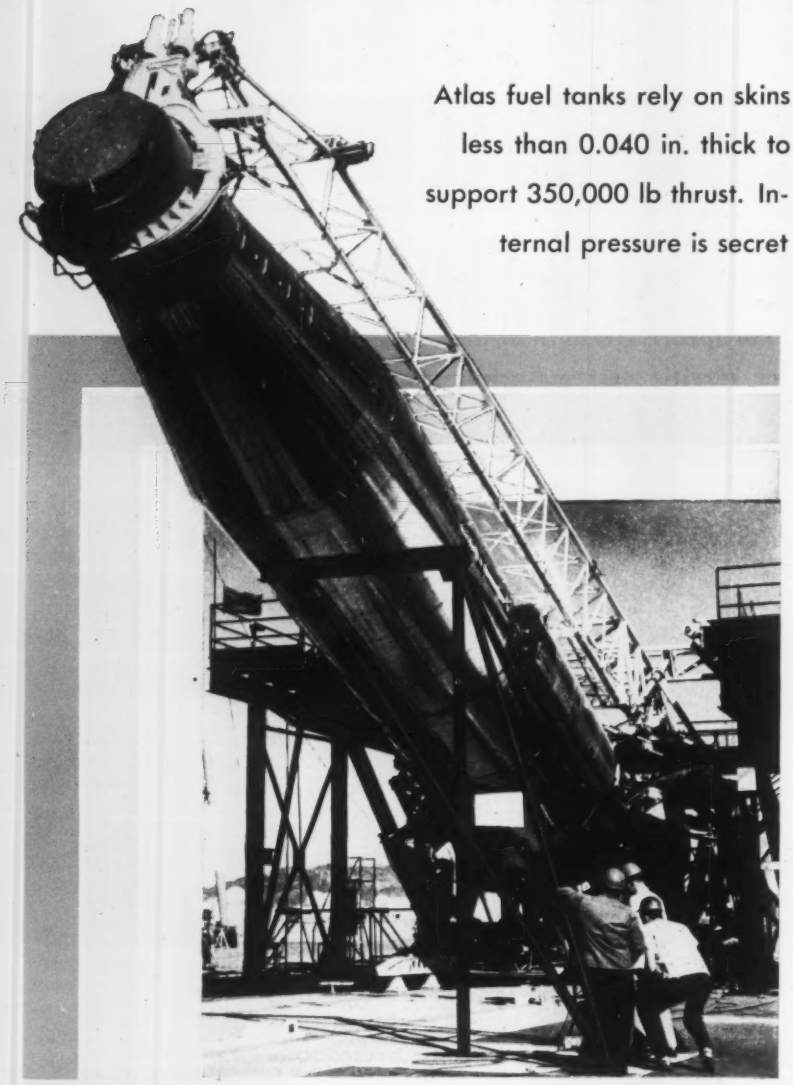
There was no evidence of abrupt changes in behavior or structure during the test periods of 1 to over 2000 hours. All samples exhibited highly ductile properties and small likelihood of transitions or structural changes.

The values obtained for pearlitic malleable irons compare favorably with those published for molybdenum-alloyed irons, states Mr. Heine. Pearlitic malleable irons appear equal to alloyed high carbon materials containing up to 0.5 per cent molybdenum, which has been added to enhance their elevated temperature properties by stabilizing the carbide phase.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Inflating Missile Tank Imparts Strength To Thin Walled Stainless Structure

Atlas fuel tanks rely on skins less than 0.040 in. thick to support 350,000 lb thrust. Internal pressure is secret



ATLAS ICBM is raised to firing position by nose and tail. Football principle imparts great rigidity to the missile. Tank walls form the outer skin for missile

NEXT TIME you have to make a big, light storage tank you might consider the football technique developed by Convair, a division of General Dynamics Corp., San Diego, Calif.

The idea: To make a thin walled tank sturdy, keep it inflated.

That's the way the fuel tank section of the Atlas missile is made. Even though the stainless walls are less than 0.040 in. thick, there are no stiffeners. The tank is 10 ft in diameter, 60 ft long, and holds tons of liquid oxygen and fuel (gross weight, 130 tons). Even after the enormous vibration and stress of takeoff, the structure will withstand out-of-control gyrations several thousand feet up, says K. J. Bossart, technical director of Convair-Astronautics Div.

• **Stainless skins are spotwelded to lap strips.**

Washington Steel Corp., Washington, Pa., supplies a special grade of Type 301 to fit the welding techniques needed.

Construction starts with butt-welding of sheets 3 ft wide into sections. Lap welds join sections to form the 10 ft cylinder. During construction, the tank is supported by temporary external rings.

The forward end of the tank tapers up to a domed, stainless bulkhead. A larger one at the center separates the tank into two storage areas. A cone-shaped head forms the aft section.

Final welding takes about 16 hours. Two-man teams are rotated every 2 hours—they enter and leave the missile body through a 2 ft access hole in the bottom.

When welding is completed, the access hole cover is attached and the vessel pressurized. When the supporting rings are removed, cranes can lift and move the tank (without a carrying fixture).

• **Design makes Atlas a multipurpose power unit.**

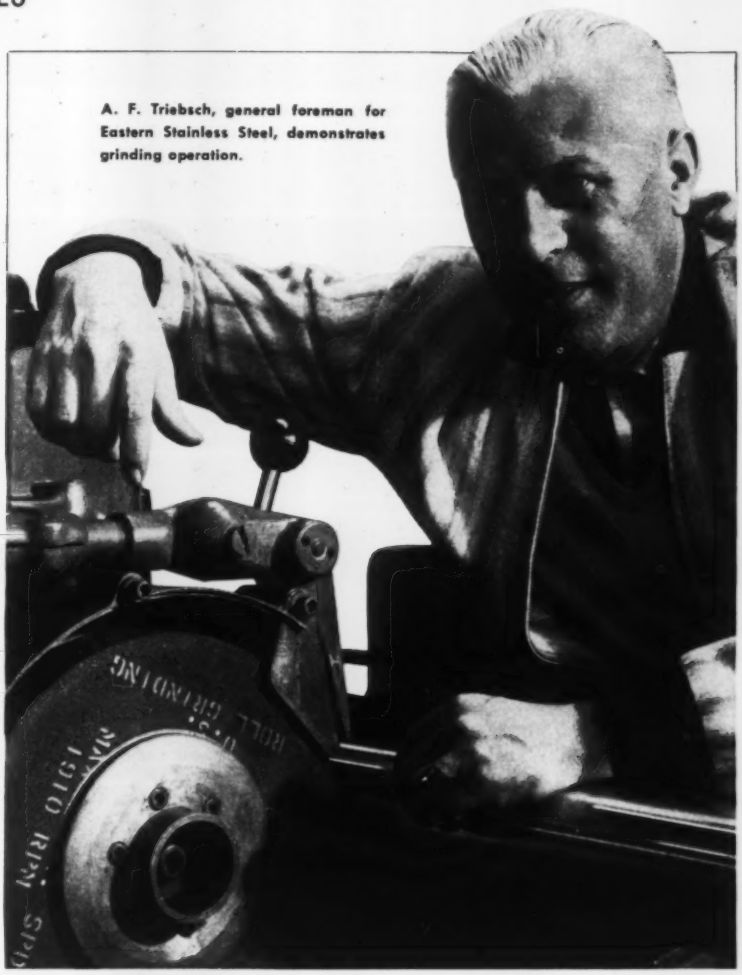
The thin-skinned approach makes it easy for airframe people to convert the Atlas power section for other missions. Atlas boosters are being built for the Vega, Centaur, Discoverer, and Mercury space programs by upgrading skin thickness in some areas and substituting 10 ft bands to replace the forward tapered sections.

• **New launching site is announced.**

The Air Force Ballistic Missile Division is building a launching base for the Atlas at Warren Air Force Base, about 20 miles northwest of Cheyenne, Wyo.

Trailers are used to take missiles from horizontal storage to the site. The thrust section is attached to the launcher and the end clamped to a 70 ft erector boom which tilts the missile into position.

US RUBBER GRINDING WHEELS



A. F. Triebsch, general foreman for Eastern Stainless Steel, demonstrates grinding operation.

Production UP 8%!

"U.S." Grinding Wheels help EASTERN STAINLESS STEEL achieve tolerances of 2/10 of .001" in precision work

In producing stainless steel of great precision, the steel passes through a succession of work rolls under a combined force of 59,000 pounds per square inch. All the rolls must be perfectly round and the tiniest defect must be eliminated. To produce a perfectly flat mirror finish, the rolls have to be 2/10ths of .001" perfect!

This is the kind of work Eastern Stainless Steel Corporation turns out every day. To keep their rolls in perfect balance and symmetry they use "U. S." Grinding Wheels. These amazing wheels allow for no "chatter" or vibration, consequently they never groove the roll. Prior to the use of "U. S." Grinding Wheels, at least an hour a day was lost when the operator had to readjust the machine.

Using "U. S." Wheels, Eastern Stainless Steel found many collateral advantages. Maintenance was reduced by more than 20%. "U. S." Grinding Wheels outlast conventional wheels at a ratio of 4 to 1, an obvious saving of 400%.

You, too, can effect important economies and achieve greater precision by turning your grinding wheel problems over to U. S. Rubber.

US RUBBER

Mechanical Goods Division

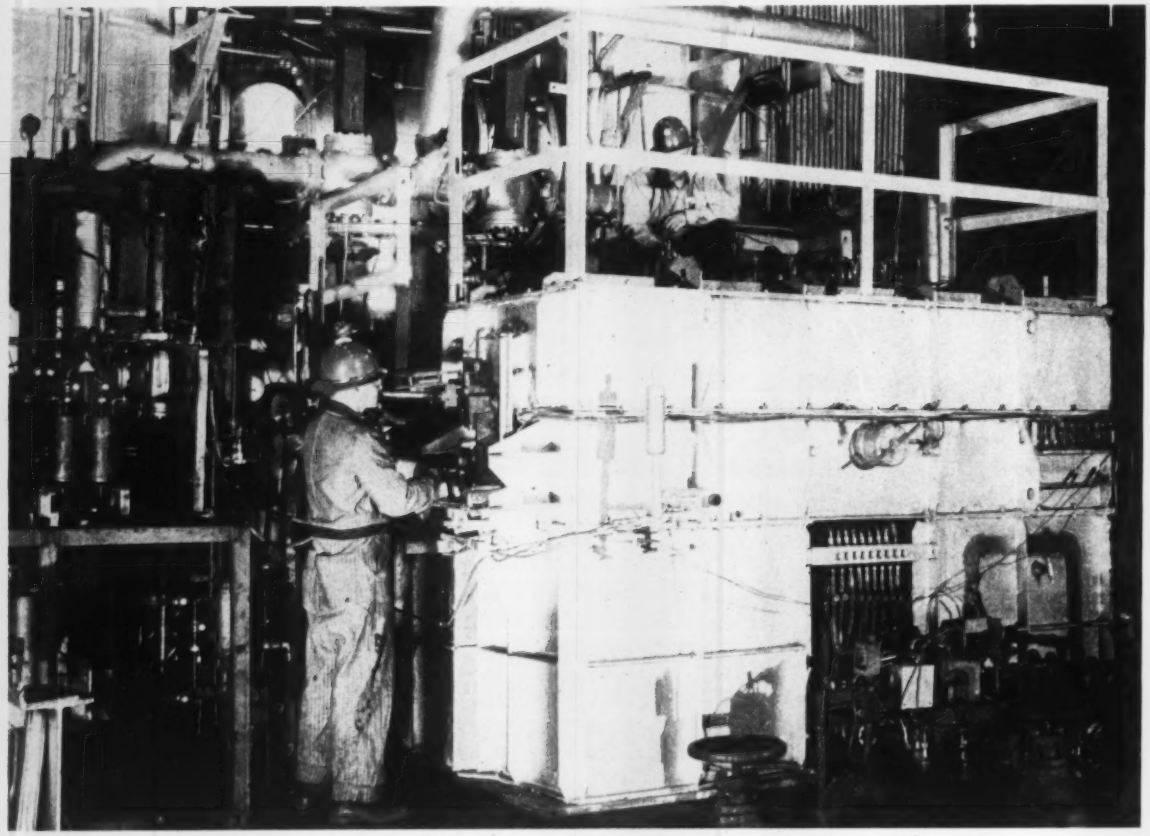
United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Steel Keeps Pace in the Space Race

Applied Research Laboratory at South Works, Chicago, helps United States Steel Corp. meet demands for higher quality steel. An experimental open hearth permits more accurate combustion studies. Work is continuing on the company's Nu-Iron process for reducing iron ore to iron. Vacuum remelting, vacuum casting, and oxygen steelmaking are also under study



Observer checks flame characteristics in an experimental open hearth. A water-filled tank replaces the metal charge, permitting more accurate combustion studies

NEW AND BETTER steels are on the way to meet your Space Age needs. It may take longer for some to reach the market than others, but one thing is certain: Steel companies are devoting millions of dollars and manhours to ambitious research programs aimed at meeting customers' demands for higher quality materials that will be needed in the soaring sixties.

Example: Several projects, in process at the Applied Research Laboratory of United States Steel Corp.'s South Works, Chicago, show promise. Most of them originated at the company's research center at Monroeville, Pa., says Dr. James B. Austin, administrative vice president-research and technology. Five are outlined here.

• **Improved steelmaking techniques are expected to result from combustion studies in an experimental open hearth.**

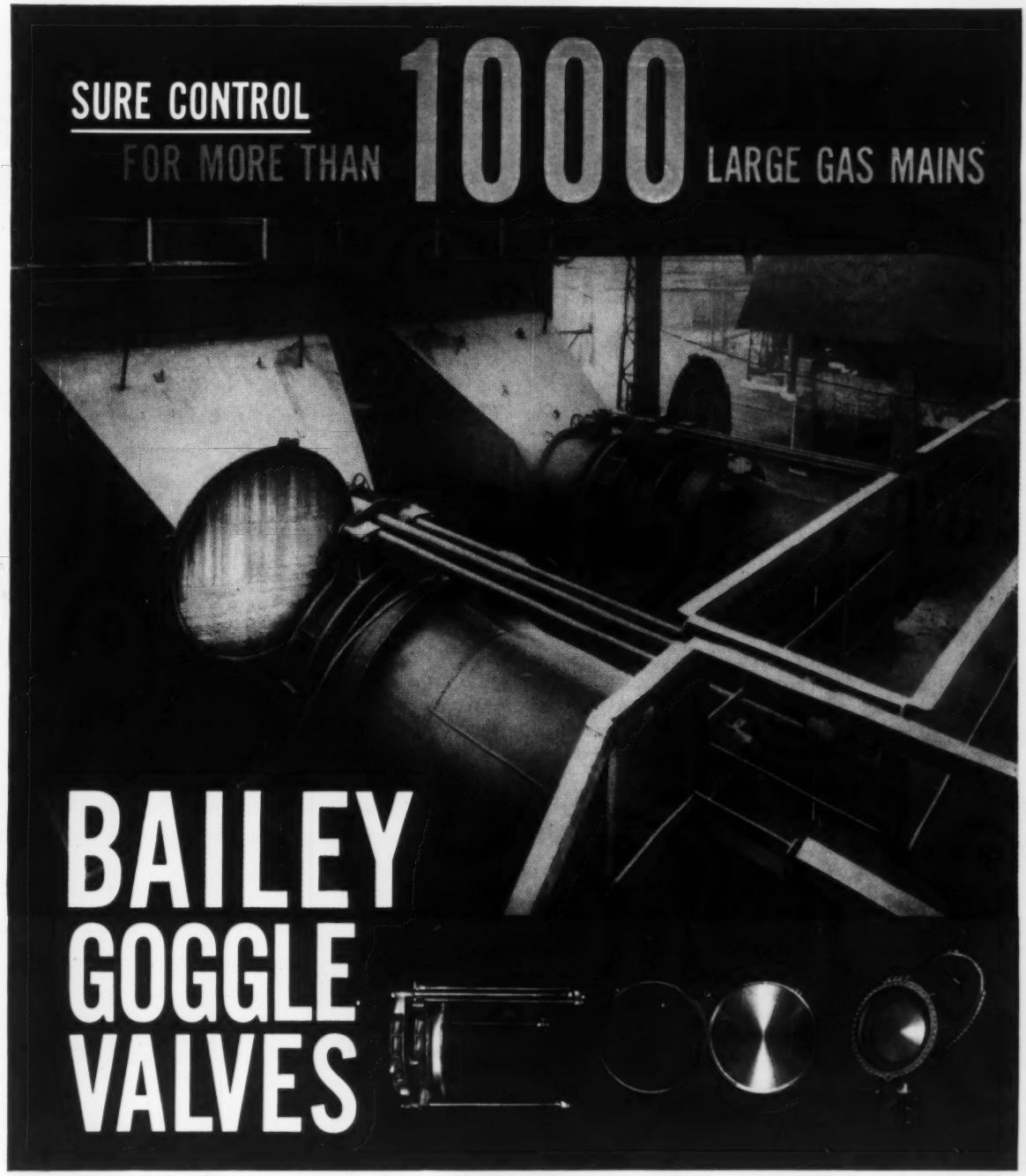
The furnace is an oil-fired 1/12 scale model of a 300 ton commercial unit. It's used to study temperature distribution, and the relative effects of flames applied to the metal bath at various points. (Some steelmen doubt that top firing is the most efficient heating method.)

To separate combustion effects

(*Please turn to Page* 93)

SURE CONTROL

FOR MORE THAN 1000 LARGE GAS MAINS



BAILEY GOGGLE VALVES

Thermal Expansion Goggle Valve . . . Goggle Plate . . . Mechanical Goggle Valve

Widely used on blast furnaces, gas washers, precipitators and boiler plants, Bailey Goggle Valves assure safety and efficient service—regardless of the time they may remain unused.

These valves are made in two types: *Thermal Expansion*, which utilizes the linear expansion and contraction of steel for sealing and freeing the goggle plate (for 48" to 120" lines); *Mechanical*, on which a powerful clamping force is applied at all points around the disc periphery (for 6" to 72" lines).

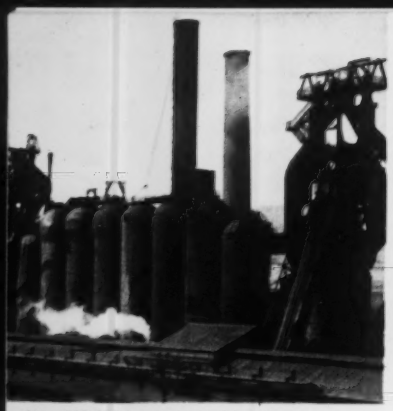
• *Write for Bulletin.*

WILLIAM M. Bailey COMPANY

ENGINEERS

LEADERSHIP THROUGH QUALITY

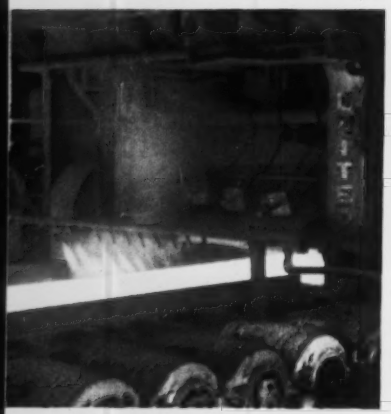
1221 BANKSVILLE ROAD PITTSBURGH 16, PA



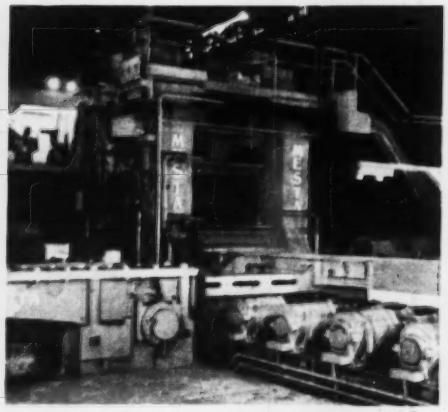
New 400,000-ton capacity blast furnace

New $11 million basic oxygen furnace facility

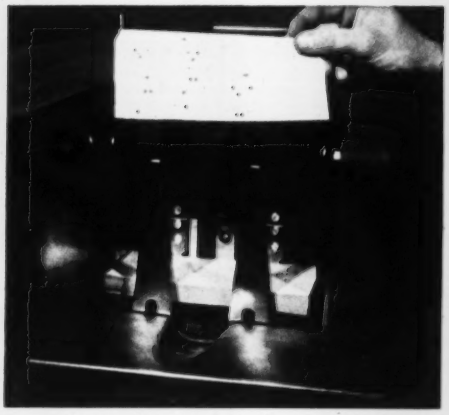
New $74 million, 11-furnace open hearth shop



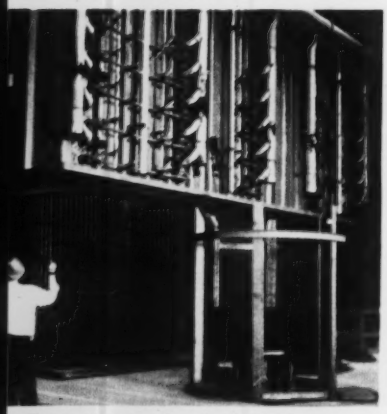
New horizontal scale breaker



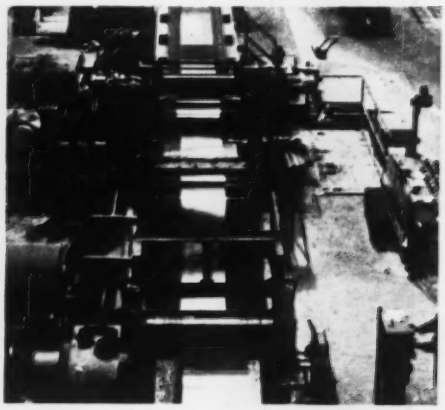
New $12 million reversing roughing mill



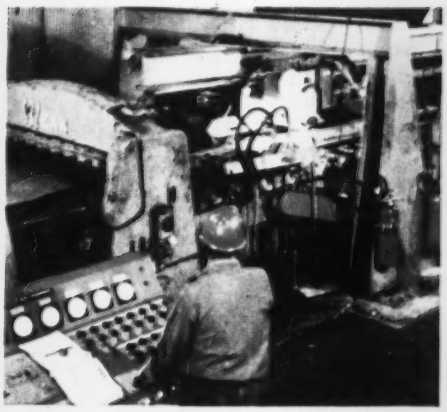
New punch-card controls for quality control



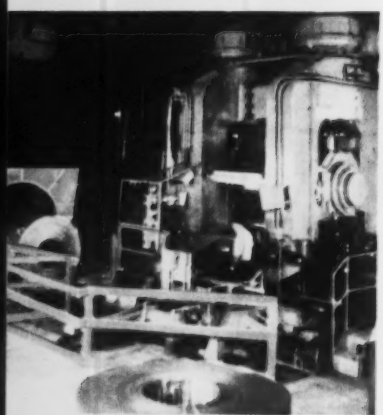
Twenty-five new annealing furnaces



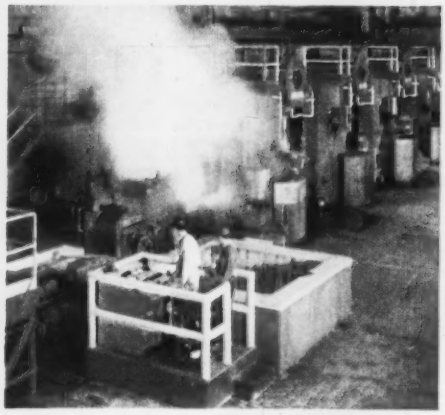
New high-capacity cold shear line



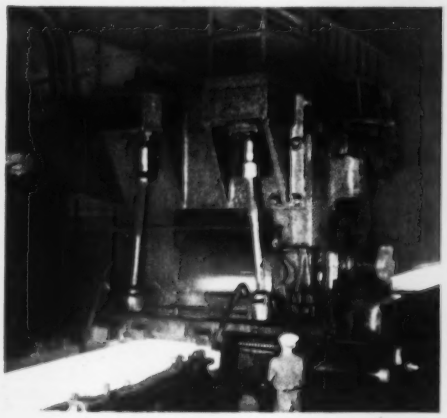
New ⅜-inch high-speed hot shear line



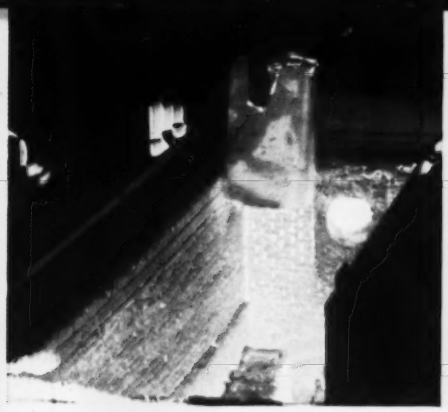
New 56-inch precision temper mill



New $36 million, 44-inch hot strip mill



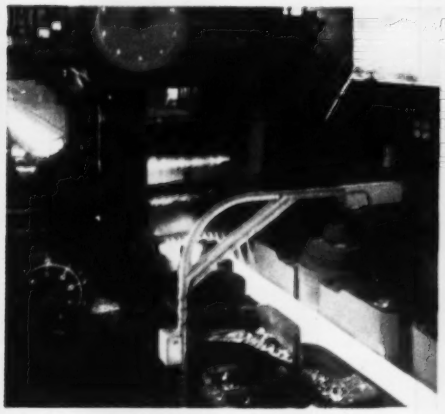
Improved 96-inch hot strip mill



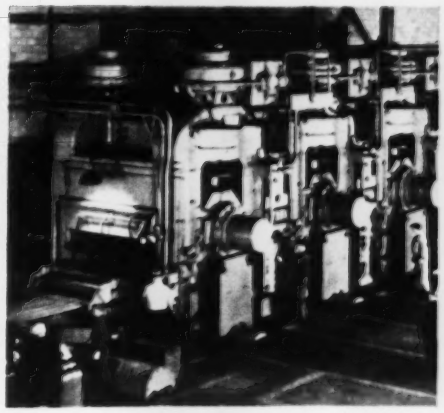
New ingot re-heating furnaces in all steel plants

New $17 million, 68-inch blooming mill

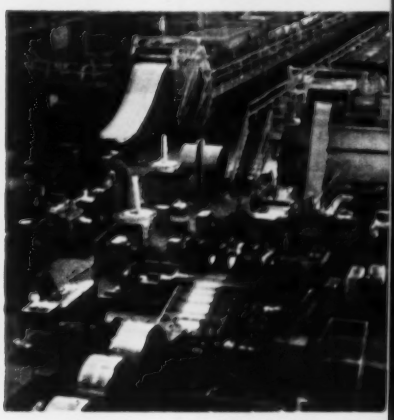
New automatic oxygen scarfer



Vertical edgers to assure accurate coil width



World's fastest cold reducing mill of its kind



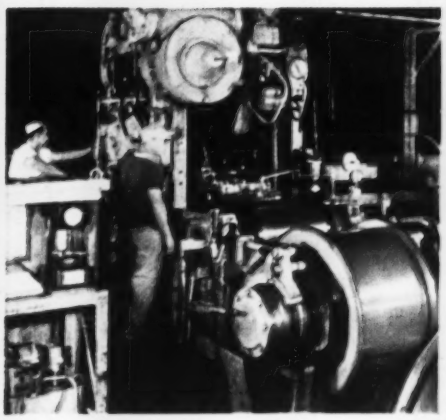
New pickling line handles 60,000-lb. coils

J&L

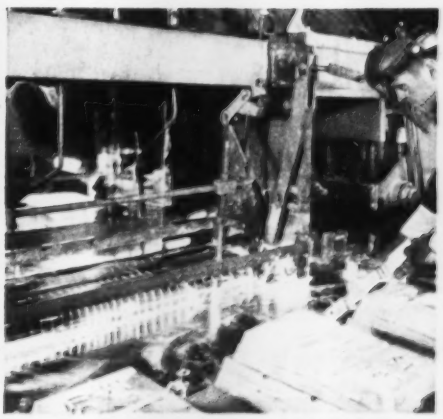
There is a new J&L, which has invested nearly 800 million dollars in new and improved facilities . . . more than twice the company's total value at the end of World War II. This gives us greatly-expanded production capacity, and enables us to be a steady, dependable source of supply for carbon and stainless sheet and strip, and many other products, to present customers and customers we never served before.

Jones & Laughlin Steel Corporation

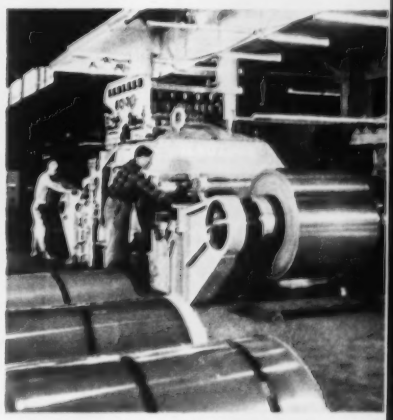
PITTSBURGH, PENNSYLVANIA



Strip steel, a new product for J&L



New $6¼ million Sendzimir galvanizing line



New $62 million stainless steel facilities

New SPECIALIZED

Harbison-Walker Refractories meet the intensified conditions of today's aluminum industry

Within the last couple decades the production of aluminum metal in the United States has trebled and the number of its alloys has increased manyfold. Rapid evolutionary developments created the need for refractories to meet new conditions. The severity of corrosion, more destructive impact accompanying furnace charging and the necessity of avoiding contaminants for meeting rigid alloy specifications—these among other factors have become increasingly important.

Since the first commercial production of aluminum and its alloys, Harbison-Walker brands, primarily of alumina-silica and high-alumina compositions, have continued to fulfill the ever-growing demands. Through unceasing research several refractories, recently developed specifically for aluminum melting furnaces, possess definitely superior properties for maximum durability and best quality of metal. Harbison-Walker's CORALITE XX (85% alumina brick) has established excellent service records in aluminum furnace bottoms and side walls. Several modifications with enhanced properties now are in commercial production.

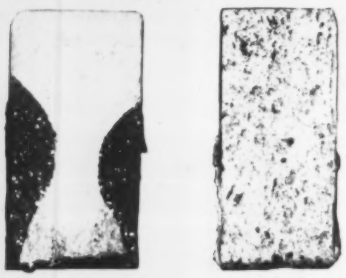
These unique refractories expecially suited for aluminum melting furnaces are here briefly described.

CORALITE 22-58 is a stabilized aluminum phosphate bonded brick containing approximately 85% alumina. It has exceedingly high strength and withstands greater impact and abrasion. Its resistance to wetting and penetration by the molten metal are properties of paramount importance. CORALITE 24-59 is the hard-fired variation, having still higher mechanical strength.

CORALITE 3-59 is a very hard-burned brick containing approximately 85% alumina. It is made with a special bond (patent pending) which contributes to its remarkable strength. As illustrated by the photograph showing results of the laboratory tests, it is exceedingly resistant to penetration and reaction with molten aluminum.

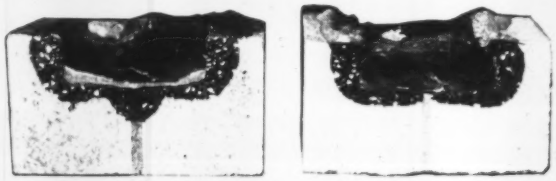
CORALBOND is a phosphate bonded high alumina mortar developed specifically for use in aluminum melting furnaces. Among numerous mortars of many compositions, CORALBOND is very outstanding in its resistance to penetration and corrosion by aluminum alloys at the furnace operating temperatures.

ALUMINUM IMMERSION TEST



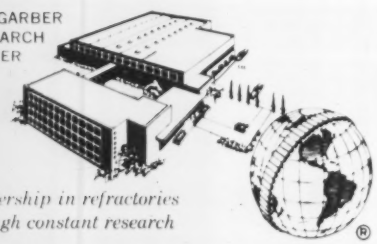
These brick, which were immersed in aluminum alloy at 1400°F. for nine days, show contrast in degree of penetration or wetting between a normal high alumina brick, left, and CORALITE 3-59, right.

MORTAR JOINT TEST



Photograph of Laboratory "Cup Tests" with molten aluminum alloy, shows striking difference in resistance to penetration and corrosion between a widely-used air-setting bonding mortar at the left and CORALBOND at the right. Among many mortars of widely different compositions, CORALBOND—as illustrated in this test—is unmatched.

THE GARBER RESEARCH CENTER



Leadership in refractories through constant research

HARBISON-WALKER REFRACTORIES COMPANY

AND SUBSIDIARIES — GENERAL OFFICES: PITTSBURGH 22, PENNSYLVANIA

World's Most Complete Refractories Service

from heat generated in steelmaking chemistry, the metallurgical charge is replaced by a water filled, rectangular tank. Water flowing through the tank absorbs heat from the flames, so it can be measured.

The furnace is so small that direct observation of the flames is impractical, so a closed circuit television camera with a water cooled telescopic lens scans the interior.

• A giant, consumable electrode, vacuum arc melting furnace makes quality alloy and stainless steels.

It can produce ingots 32 in. in diameter, weighing up to 20,500 lb which can be processed into bearing steels, high temperature stainless, high strength alloys for missiles and aircraft, and steels for rotors or other special applications.

Metal to be remelted is formed into a long, cylindrical electrode. Melting occurs in a nearly perfect vacuum. (Absolute pressure: About 5 microns of mercury.)

Vacuum melted steel contains less hydrogen, oxygen, and nitrogen than other types. It's cleaner, and relatively free of center porosity and segregation. It shows better hot workability, ductility, and fatigue strength. Creep and rupture strength are also improved.

• A multiple vacuum casting unit permits up to seven ingots to be poured from one heat of steel.

The process removes most of the hydrogen, preventing internal rupture and improving ductility.

Ingot molds are placed on a large turntable inside a vacuum tank 16 ft in diameter and 14 ft high. A 30 ton ladle is set on the tank.

A four stage, steam injector system evacuates the tank to about 200 microns absolute pressure. Steel, tapped into a conventional ladle, is poured into the vacuum casting ladle; it enters the vacuum tank and passes into one of the ingot molds.

As each mold is filled, the turntable is rotated to index the next one for pouring. The unit can handle heats as large as 45 tons.

• The Nu-Iron process, a method of reducing iron ore to iron, is undergoing study, and may be used commercially.

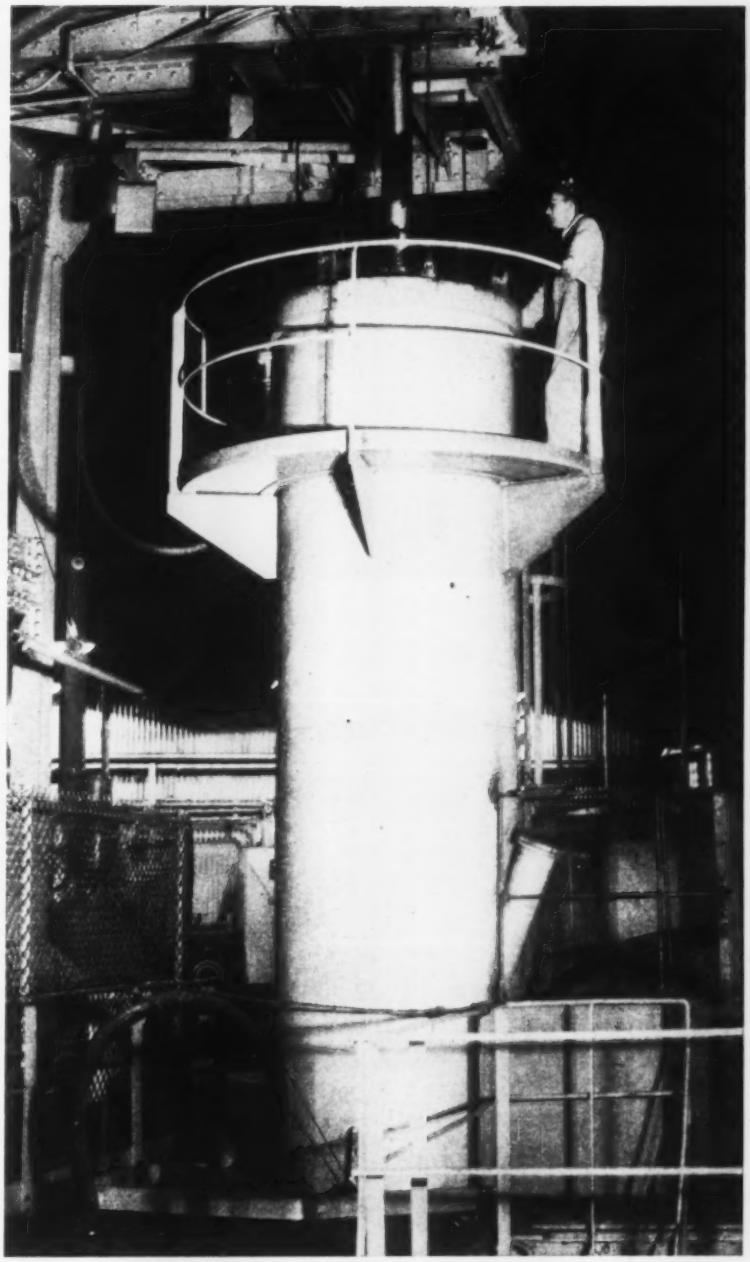
Developed at South Works, the process uses the fluidized bed principle. A bed of finely divided ore is suspended by a rising stream of hot reducing gas (hydrogen or carbon monoxide). The gas reacts with iron ore particles to produce iron.

Savings promised: Ore particles don't have to be agglomerated, and metallurgical coke isn't needed.

• The company is studying the potential of oxygen steelmaking.

The oxygen converter is said to be faster and more economical than the open hearth furnace. An experimental 8 ton converter at South Works will show steelmen how to get the most from the process.

The pear shaped vessel has a closed bottom, a hood, and a waste gas cleaning system. It will help determine the adaptability of the oxygen process to available raw materials. It should show flux requirements and obtainable yields.



Electrode alignment is checked before the vacuum arc melting furnace is turned on. It can turn out ingots 32 in. in diameter, weighing over 10 tons

New Machine Puts Radials In Elephant Tool Class

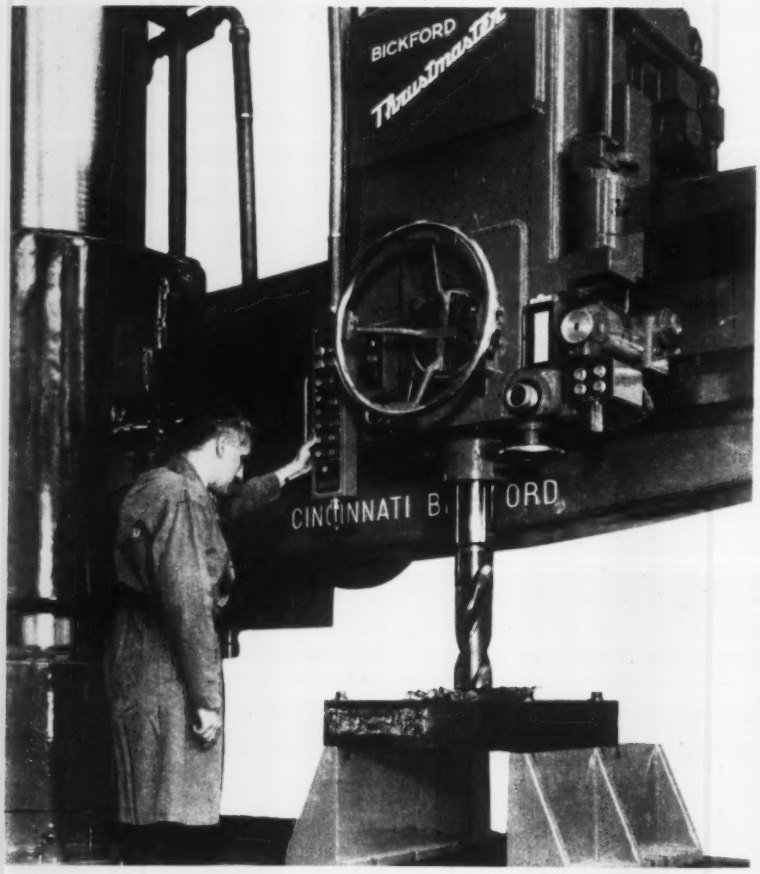
Sporting 34 in. diameter columns and arms up to 14 ft long, the machines are designed for the husky jobs. First two machines will go to GE

AS a massive 5 in. drill plunged through a thick steel plate, Cincinnati Bickford heralded the arrival of a machine that puts radial drills in the ranks of elephant tools.

Weighing 40 tons, the first of the new radials will join other giants at GE's Large Steam Turbine-Generator Dept., Schenectady, N. Y. (See STEEL, June 15, p. 92.) Bickford officials make two claims: It is the largest radial drill built in this country, and its 50 horsepower make it the most powerful machine of its kind in the world.

GE will also get the second machine off the line. Both will have 10 ft arms.

As the operator watches, 50 horsepower drive a 5 in. high speed steel twist drill into a steel plate. The machine can use 32 speeds, 18 feed rates, and six different tap leads



• **Design Innovations**—The standard new Thrustmaster radials with 34 in. diameter columns will be available with 10, 12, or 14 ft arms. Since the operator can't always reach the controls, he works with a full pendant control.

Pushbuttons in the pendant operate the power rapid traverse to the spindle and head, power engagement of the driving clutch, hydraulic head and column clamps, and movement of the arm up or down. A safety master-stop switch extends from the bottom of the pendant station. A knurled knob on the right side of the head operates a power assist to help the operator swing the huge arm.

The spindle is designed to take the brunt of heavy thrust loads generated by large drilling and backfacing tools. Seven, angular contact, antifriction bearings support the spindle. Four bearings take direct vertical thrust while the other three carry backfacing loads.

• **Dimensions** — Diameter of the spindle is 3½ in. Spindle travel is 28 in. The operator can preselect both speeds and feeds while the spindle is running.

On a demonstration job, Bickford engineers turned a Morse, 5 in., high speed steel twist drill, at 57 rpm, fed it into the steel plate at 0.037 in. a revolution.

Boom for Tape Control

In ten years, more than half of all diesinking jobs will be done by numerical control. And in the future, it's likely that about 90 per cent of all numerical control will be used for discrete positioning, about 10 per cent for continuous path contouring.

Those are opinions of Edgar L. McFerren, sales vice president, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. Mr. McFerren says that in 1959, about 10 per cent of the G&L sales will be for numerically controlled applications. He feels that in about ten years, 50 per cent or more of the company's sales will be in tape or card controlled machines.

SECO's experienced staff of trained engineers . . . men highly skilled in design and execution . . . are available to assist you in solving all problems

Predictable Performance

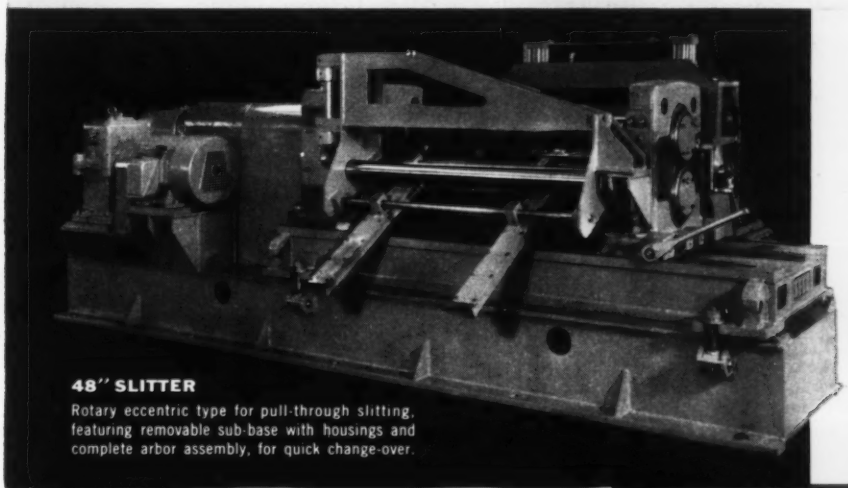
you may be experiencing through the use of ordinary Steel Slitting Equipment.

These specialists are at your service to eliminate production (and profit) bottlenecks that are unique to your particular operation and can recommend and design a Custom-Built Slitter to your exact specifications, meeting all your production requirements, with predictable performance. Call or write TODAY.

is yours
when you
change to

SECO

Slitting
Lines



48" SLITTER
Rotary eccentric type for pull-through slitting, featuring removable sub-base with housings and complete arbor assembly, for quick change-over.

SECO Steel Mill Equipment

- Leveling and Shearing Lines
- Combination Edging and Flattening Lines
- Tension Reels for Strip Polishers
- Narrow Strip Grinding Machines
- Multiple Strand Pull-out Rolls and Take-up Frames
- Strip Coilers (Up and Down Type)
- Traverse Reels for Narrow Strip
- Steel Coil Up-enders
- Scrap Ballers

SECO

Affiliated with Lee Wilson Engineering Co., Inc.

STEEL EQUIPMENT CO.
P. O. BOX 737, WARRENSVILLE STATION
CLEVELAND 22, OHIO

Numerical Control Memory Simple, Reliable, Compact

This electromechanical unit works with a tape control reader to anticipate machine actions and to speed machining operations. It's designed for precision boring

ENTIRELY electromechanical, a compact numerical control memory for precision boring machines has been developed by Fosdick Machine Tool Co., Cincinnati.

It's simple and dependable, Fosdick assures. A bank of sealed relays and switches (housed in the control console) are the only moving parts. They are plug-in types (spares are stored in the console). No electronic devices are used. Maintenance can be handled by a competent electrician.

• **Development** — Many numerically controlled machines need a memory (in addition to standard machine controls) because of the lag between tape reading and the moment when the machine can perform the action.

Memory systems with big batteries of components were considered unacceptable. Fosdick felt they were too bulky, subject to malfunctioning, and difficult to maintain.

Fosdick found dependability in the cross bar switch, a component of automatic telephone systems. The unit is a grating of crossed bars, actuated by electromagnets.

The bars in the X axis feed information into the switch. The bars in the Y axis pick it up, hold it, and release it when needed.

Each cross bar switch contains ten columns of ten contacts. In effect, the switch has 100 pockets in which digital information can be stored. Ten represent the digit 1, ten represent the digit 2, and so on.

Each switch measures 23 x 9 x 6 in. Two cross bar switches can store the information needed to control spindle feeds and speeds, and two axes of table movement. A third can handle spindle depth control and tool designations; a fourth, automatic tool changing.

Five switches are easily housed in the console furnished with the jig borers. Grinders and borers (Models 44 and 45) can be equipped in the field with the memory unit.

The first cross bar switch console made by the company has been in constant operation for more than a year without failure.

Oxygen to Gain Ground

Tonnage oxygen, costing about one-fifth what it did 12 years ago, will find increased use in metallurgical processes, says Harold B. Emerick, director of technical services, Jones & Laughlin Steel Corp., Pittsburgh.

Over 230 cu ft of oxygen is used for each ton of steel produced. Here's why: It's used in open hearths for flame enrichment during meltdown, in open hearth and electric furnaces for carbon reduction, and in the basic oxygen steelmaking process. It's also used to enrich blast furnace air.

Source of Aluminum

Using the table of aluminum producers which appeared on Page 105 of the June 8 issue of STEEL? If you are, here's an addition: Fairmont Aluminum Co., Fairmont, W. Va. It's a roller of aluminum sheets and strip.

The company is a subsidiary of Cerro de Pasco Corp.

Three Ways You Can Save With High Strength Bolts

You can lower assembly costs by finding more applications for high strength bolts, suggests Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

Design of a simple bolted joint usually limits selection to three standard fastener types: Machine bolts, bright cap screws, or premium priced, high strength bolts (ASTM A325).

Before eliminating high strength bolts for less critical joints, the company says three questions should be considered.

• **Question One**—Can the gross joint section be reduced with smaller diameter, high strength bolts? They can often be placed closer together and closer to the edge of the pieces to be fastened to permit smaller joint sections and bring about material savings—a big item when you're working with costly materials such as copper bus bars.

• **Question Two**—Can the number of holes to drill and fill be cut by high strength bolts? Reducing the number of fasteners can slice assembly costs. For example, three bolts, placed 120 degrees apart around a common center provide as stable a joint as one fastened with four bolts 90 degrees apart. The company claims that the additional work involved in drilling and filling the extra hole is seldom justified.

• **Question Three**—Will total fastener cost be reduced? Four high strength bolts ½ in. in diameter cost less than four ⅝ in. cap screws and both provide the same holding power, says RB&W.

• **Tip**—The company advises: Buy bolts in terms of holding power.

Hastelloy alloy C racks are used to hold aluminum assembly during preheating and dip brazing. Here, rack and parts are about to enter the 1120° F flux bath

Alloy Triples Rack Life

A LARGE eastern automotive parts plant has tripled service life of furnace brazing racks used in a semiautomatic setup for brazing aluminum evaporator parts. The racks have to stand high temperatures, corrosion, and thermal shock.

The company makes the gain by using racks of Hastelloy alloy C, a product of Haynes Stellite Co., Kokomo, Ind., division of Union Carbide Corp. The racks have been in use more than two years. They are fabricated from hot rolled bar stock, ½ to ¾ in. in diameter, and are welded into rectangles about 1 x 2 ft.

The racks can be used for as many as 600 dips during the dip brazing cycle without cracking or corrosion. After each ten dips, they are given a surface grinding treatment. Racks made of a previously used material had to be discarded after 175 dips.

The evaporators, used as part of automotive air-conditioning systems, are assembled on the racks and charged into a preheat furnace held at 1010° F. They remain in the furnace for about half an hour. The assembly then is dipped into a salt bath furnace which contains molten aluminum flux. The molten bath, maintained at 1120° F, provides the fluxing material and the heat for brazing the evaporator parts together. Each unit stays in the bath for 2 minutes.

After brazing, the parts are submerged in hydrochloric acid (25 per cent by volume) to remove the flux. Then, they are put into a cool water rinse and back into hot water.

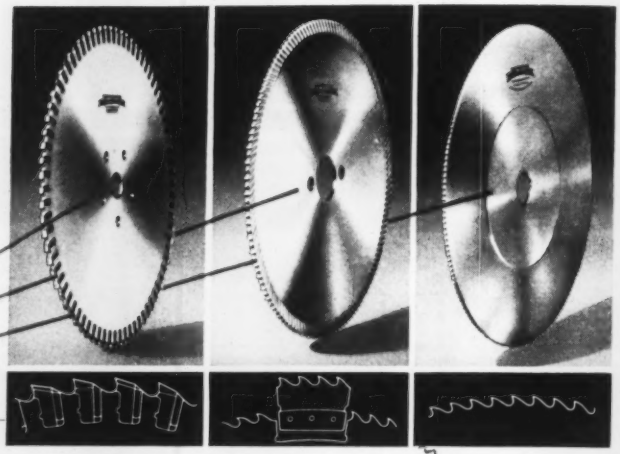
Do you cut ferrous metals? If so, Simonds has three basic saw designs for you:

INSERTED TOOTH METAL SAWS

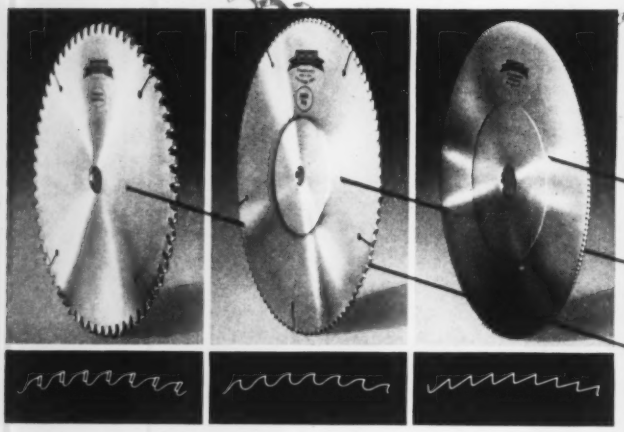
SEGMENTAL SAWS

SOLID TYPE SAWS

Available in High Speed and Semi-High Speed Steels



There's a SIMONDS Circular Saw Exactly Right for Your Metal Cutting Job



If you're cutting non-ferrous metals, Simonds offers you:

SOLID STEEL SAWS
Available in "Si-Maloy", in High-Speed Steel for cutting where extreme abrasiveness is present, and in Semi-High Speed Steel.

HIGH SPEED STEEL, HARD RIM SAWS
Hard cutting edge, soft center gives you long life coupled with safety.

CARBIDE TIPPED SAWS
for cutting aluminum and magnesium, as well as other non-ferrous metals

No matter what kind of metal you're working, there's a quality Simonds blade just right — a blade that means faster, cleaner cuts, longer blade life and maximum performance.

Find out how a Simonds Circular Metal Cutting Saw can mean important savings for you.

For Fast Service from Complete Stocks
Call your
SIMONDS Industrial Supply DISTRIBUTOR

SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, Meridian, Miss., Shreveport, La., San Francisco and Portland, Ore., Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que.

Fork Lift Truck Travels in Any Direction

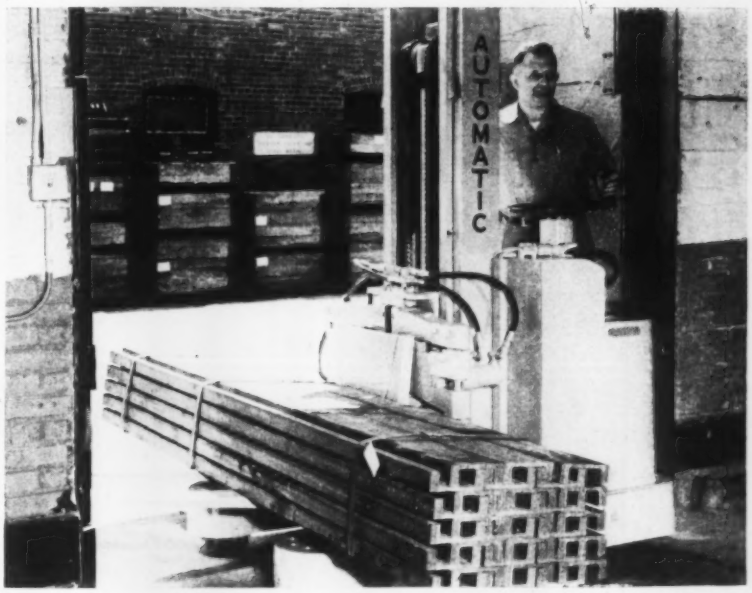
HERE is the answer to unusual material handling problems—the Transveyor Crab truck can travel in any direction with any shaped load.

Because of its unique steering, the truck can get into space which bars use of conventional trucks. It is easier to steer in tight aisles, steer around corners, and do right angle stacking.

The Steero-Matic steering and twin drive motors are operated by one control lever which provides forward and reverse turning without use of the steering wheel. Angle and side steering are controlled by the steering wheel.

The truck, which has a 65 in. over-all length, can turn completely around in a 70 in. circle. Bulky, odd shaped loads can be carried across the truck's fork and moved sideways down the aisle. Placing and positioning the load is done with a reach-type fork attachment which can swing the load 30 degrees each side of center.

The Crab truck's over-all width of 43 in. will permit it to operate in pallet rows, to pick up 42 in. wide loads far down the row. It will also be able to reach over a load to pick up the second load stacked behind it. Fast travel (5 mph light, 4 mph loaded) and lift speeds (32 fpm light, 22 fpm fully loaded) provide safe, efficient handling.



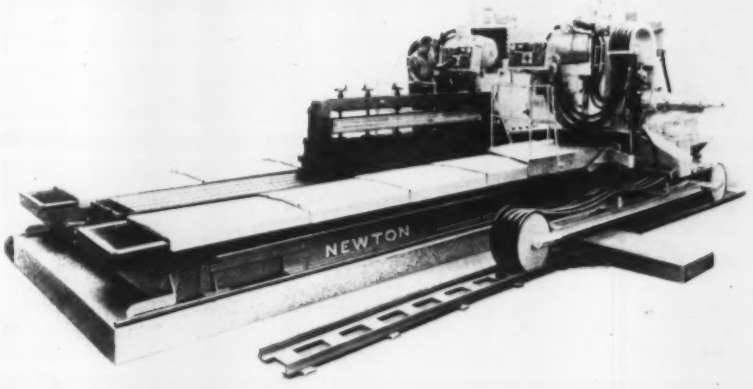
For more information, *write* Automatic Transportation Co., division of Yale & Towne Mfg. Co., 149 W. 87th St., Chicago 21, Ill.

Cavity Miller Machines Both Sides of Work

OPPOSING sides of high alloy steel parts can be cavity milled at the same time on the Farrel-Newton machine. Besides reducing the time for setup and handling of the workpiece, milling time is halved. Also distortion of the workpiece is less when both sides are milled simultaneously.

The machine can be built to meet individual requirements. Because each side of the miller is tape controlled separately, it can be built with one head as an open side machine. If a duplex machine is required later, the base, column, and milling head can be added.

Each spindle is driven by a 60



hp, adjustable speed motor. Four mechanical changes provide a cutting speed range of 15 to 3600 rpm for milling iron, steel, or any nonferrous metal.

Separate floor-mounted control panels, containing magnetic tape transports, reading heads, and associated controls are provided for each side of the machine. A reel system is included to carry electric power and control to each traveling column assembly.

Accuracy of the work can be held to tolerances of plus or minus 0.0005 to 0.002 in., depending on the travel rate.

For more information, *write* Consolidated Machine Tool Div., Farrel-Birmingham Co. Inc., 565 Blossom Rd., Rochester 10, N. Y.

Portable Unit Balances Grinding Wheels Quickly

SAVINGS of up to 80 per cent in grinding operations are possible if you can balance grinding wheels fast and accurately without having to remove them.

Aero Supply Mfg. Co. Inc. says it has a unit that can balance a wheel and return the machine to production in less than 30 minutes. That substantially cuts downtime and reduces the number of rejects that can develop from improper balance.

Once the hub and wheel are in position, accuracy is achieved by use of three adjustable weights inserted in the hub. Balancers for internal, external, centerless, and center grinding machines will be included in the line.

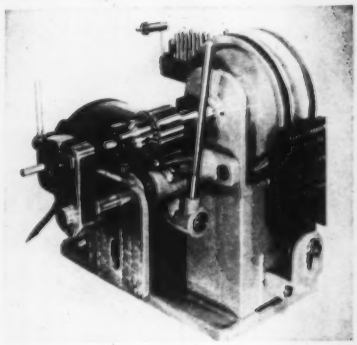
For more information, *write* Aero Supply Mfg. Co. Inc., Corry, Pa.

Hand Fed Power Threader Can Do Production Jobs

TOOL BREAKAGE can be kept to a minimum with the Sensi-Threader. All work is hand fed which enables the operator to feel strain, such as when tapping holes, and ease off the feed rate to prevent breakage of the tap.

The unit can do a variety of operations—hand threading and tapping, precision undersizing of threads to be electroplated, chamfering, deburring, countersinking, stud threading, reaming and spotfacing, and shaving plating buildup on plating hooks.

With simple holding fixtures on the work plate, castings, stampings, moldings, and machined pieces can be threaded on a production basis. It can also be adapted for fast assembly work with a spindle nonreversing attachment, using



tools such as screw drivers, hex keys, and nut sockets in the Jacobs chuck.

For more information, *write* Sensi-Threader Sales Co., 4820 49th Ave. S.W., Seattle 16, Wash.

Arcwelders Do Repair and Light Manufacturing Jobs

LOW INITIAL cost and long expected service life make a line of eight horizontal type Sureweld electric arcwelders well suited for general repairwork and light manufacturing jobs.

The units have comparative high open-circuit voltages which give easy arc striking and excellent arc stability. All models operate from single-phase alternating current.

The eight welders provide welding current ranges from 20 to 295 amperes.

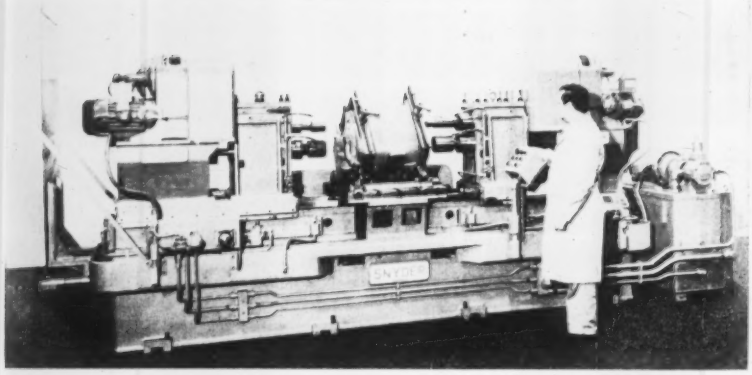
For more information, *write* National Cylinder Gas Div., Chemetron Corp., 840 N. Michigan Ave., Chicago 11, Ill.

Spring Retained Rollers Easy to Mount or Remove

SPACING of rollers in conveyors to fit the job is a simple task with the A-F Roller. Its spring-retained axle permits individual rollers to be mounted or removed easily from the frame.

No special tool, skill, or strength is needed for installation or removal. To place a roller in position, one axle end is inserted in the hex hole in the frame; the other axle end is depressed manually, then released into the corresponding hex hole in the opposite frame.

Rollers are available in various diameters in plain bearing and dust-



DOUBLE-END PRECISION BORING MACHINE accommodates eight machining variables in 16 transmission cases. The electrically controlled, hydraulically operated machine bores two holes in each end of transmission cases. The variables that the machine is designed to accommodate, in addition to length, include variations in sizes of all four holes, in depth of two holes, in center distance of the holes, and in spindle speeds required for both cast iron and aluminum cases. For more information, **write** Snyder Corp., 3400 E. Lafayette, Detroit 7, Mich.

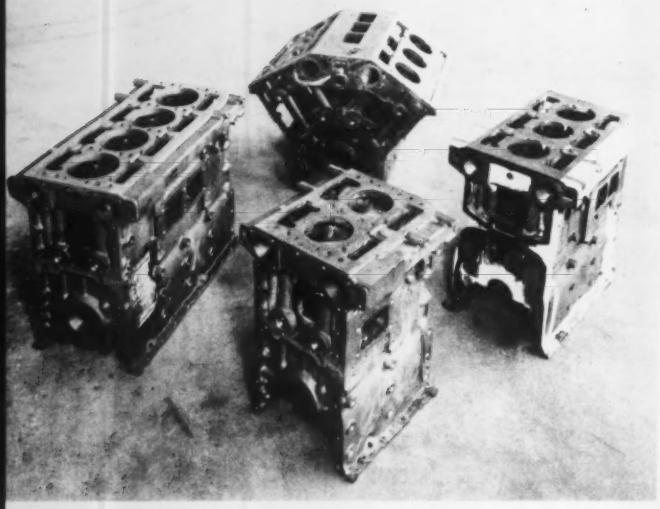
Tomorrow this transfer machine will work on a different part

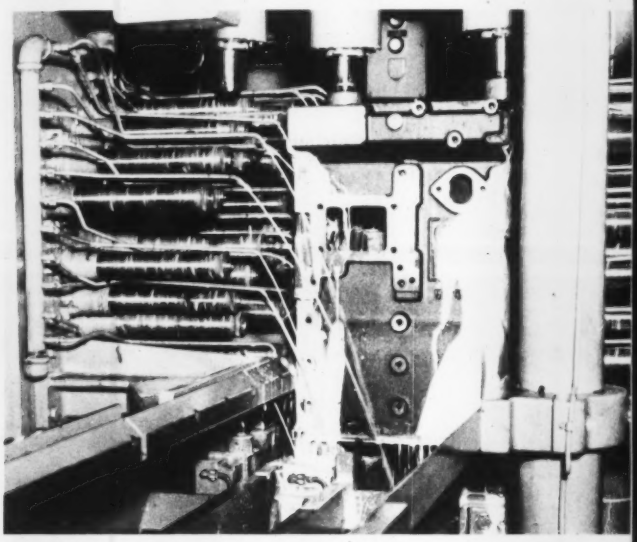
. . . Natco flexible automation can speed your production too.

(see other side)

FOUR PARTS OR ONE CAST IRON OR ALUMINUM

It's all the same to these Natco transfer machines





Look at these four diesel engine blocks. Each is a different machining problem, yet one line of three Natco Holeways does the complete job on them all.

Natco designing skill shows in the easy way these machines accept the four different blocks, either cast iron or aluminum. In only 40 working stations these machines can perform 485 operations. Ingenious transfer devices enable all faces of the workpiece to be machined. Versatile building block construction keeps the line ready for conversion when models change.

Natco Holeway No. 1 is capable of performing 173 different operations—drilling, rough boring, reaming, chamfering and counterboring.

Holeway No. 2 does 139 similar operations, including end milling of these same engine blocks.

Holeway No. 3 performs 173 tapping operations. These machines work on all the external faces of the blocks, including the angular faces of the V-block.

Product mix problems? Think what a truly flexible Natco like this could do for them! Weigh the value of a Natco which accepts a variety of parts and decides what work to do on them. Even if your production won't justify this ultimate in automatic machining—Natco builds drilling, boring, tapping, facing, reaming, chamfering machines in all degrees of automation.

Standard or special, if your machining job is holes, Natco makes the machine to do it better. Let our representative show you. Call him today.

NATCO NATIONAL AUTOMATIC TOOL COMPANY, INC., RICHMOND, IND.

tight construction. Frames are available in varying widths with multiple spacing of punched holes to make for easy changing of roller spacing.

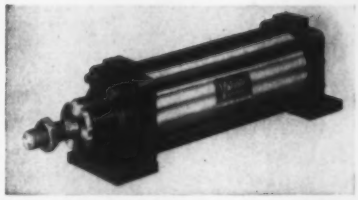
For more information, *write* Alvey-Ferguson Co., 3386 Disney St., Cincinnati 9, Ohio.

Valves Easy to Maintain

HERE is a line of heavy duty air and hydraulic cylinders, built to JIC standards, for use on automated and other high production machinery.

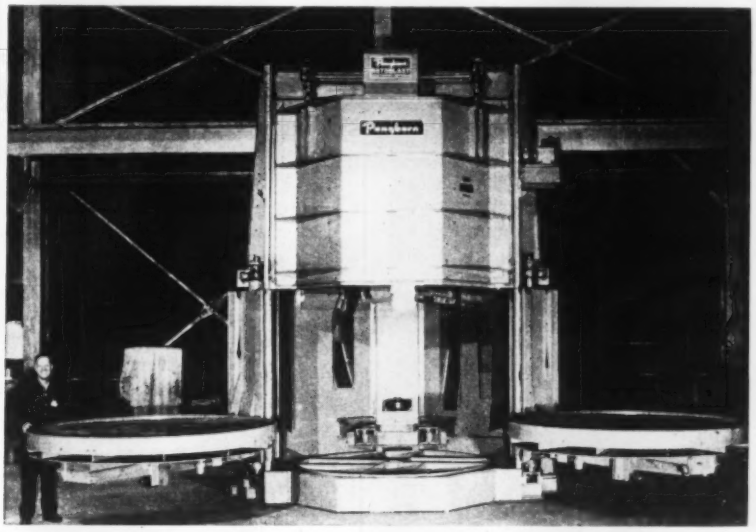
The Valvair cylinders are built to provide performance, dependability, and ease of maintenance. The long bronze rod bearing, with length-to-rod diameter ratios up to 2:1, provides maximum rod stability and resistance to side-loading deflection.

To minimize in-service downtime, the Hycar rod wiper and metallic-backed rod seal are installed in an easily removable cartridge. The seal cartridge can be replaced without partially disassembling the cylinder. Removable cylinder port adapters permit replacement of the cylinder



assembly without disturbing basic piping connections. If threads are damaged, scrapping of the entire head can be avoided by using new port adapters.

For more information, *write* Valvair Corp., 454 Morgan Ave., Akron 11, Ohio.



Cleaning Unit Handles 5-Ton Castings

INDIVIDUAL castings weighing up to 5 tons can be cleaned with minimum handling time in the 8 ft capacity, twin table Rotoblast room.

With the twin table system, one worktable of the machine is outside where castings or weldments can be reloaded, turned, or unloaded while the other table load is revolving inside the blast cabinet. An air lock clamp holds the table inside the cabinet and kicks it out when released. The operator has only to walk with the table to keep it moving until it is latched in the "out" position.

The cleaning unit has two Rotoblast wheels with 30 hp motors capable of throwing 100,000 lb of abrasive per hour. One of the two wheels is mounted on the top deck of the room, blasting 90 degrees to the table top, and the second is positioned to provide cleaning of top and sides of the work.

Workpieces up to 8 ft in diameter and 3 ft 6 in. high can be loaded on the table outside the cabinet and positioned by any kind of handling equipment.

For more information, *write* Pangborn Corp., Hagerstown, Md.

Detector Spots Defects In Ferrous Metal Parts

THE Detectascope locates invisible discontinuities (such as subsurface cracks, laps, voids) and grinding, welding, and heat treating cracks without damage to the part or danger to the operator. It also demagnetizes the part after inspection.

The inspection system consists of a removable electromagnet and demagnetizer unit with handle, extension cord and foot switch; and a black light hood assembly, transformer, 5 gallon tank, agitating pump, and voltage regulator in a mobile cabinet.

The electromagnet is placed on the part to be explored, or small parts may be brought to the electromagnet station. Current is turned on and the area to be inspected is painted or sprayed with an oxide solution from the tank. Iron particles in the solution concentrate wherever there is a defect.

For more information, *write* Ferro Machine & Tool Corp., 5514 W. Washington St., Indianapolis 41, Ind.

Electronic Feeder Kicker Breaks Up Jammed Parts

HERE is a controlled feeding device for miniature parts that automatically breaks up jams or inertia which often result from the interlocking of pieces, the presence of dirt, dust, vapor film, and static electricity.

It can be used on any shape or type of part made from metal,

glass, compressed powder, plastic, and assembled parts in any size from 0.004 to 0.5 in. Known as a Kicker, the unit keeps pieces moving by a timed energy impulse that jars the parts. Impulses are adjustable from 5 to 60 seconds, and in varying degrees of energy output as required by the nature of the pieces being fed.

Feeding speeds as slow as one per minute can be achieved. It also is effective at normal feeding speeds of 200 to 300 per minute. It assists in the orientation and positioning of parts.

For more information, *write* Affiliated Manufacturers Inc., Oldwick, N. J.

Alloy Boosts Die Life

GALLING, scratching, loading, and pinching in drawing and forming stainless steel and other clean metals can be eliminated with Ampco DiBronze, an aluminum-bronze die alloy.

The sliding action of dissimilar metals over the wear-resistant bearing alloy results in less friction. Die life is increased, finishing costs are lowered, and downtime for redressing dies is minimized even on extremely long production jobs.

The die material has high toughness and impact resistance, high as-cast hardness (no heat treating), good machinability, and resistance to wear and abrasion.

For more information, *write* Ampco Metal Inc., 1745 S. 38th St., Milwaukee 46, Wis.

Automatic Machine Inserts Variety of Small Parts

WITH interchangeable tooling, the Sertomat automatic inserting machine can be used on such parts as terminals, connectors, pins, studs, and many types of fasteners. Electrical interlocking permits use of the machine in automated setups, such as multiple head arrangements, and by tape or template control.

Parts are fed from two hoppers through chutes to put them in proper position. They are pressed into place by a cam-operated ram which is adjustable for pressing force, feed, and stroke. A lower unit has a retracting pin to facilitate accurate positioning of parts when necessary. Insertion rates up to 3000 pieces an hour are feasible.

For more information, *write* Hill Machine Co., 1301 Eddy Ave., Rockford, Ill.

Coating Protects Parts During Plant Processing

HERE'S a method for protecting metallic and nonmetallic surfaces from abrasion, scuffing, and corrosion during in-plant processing.

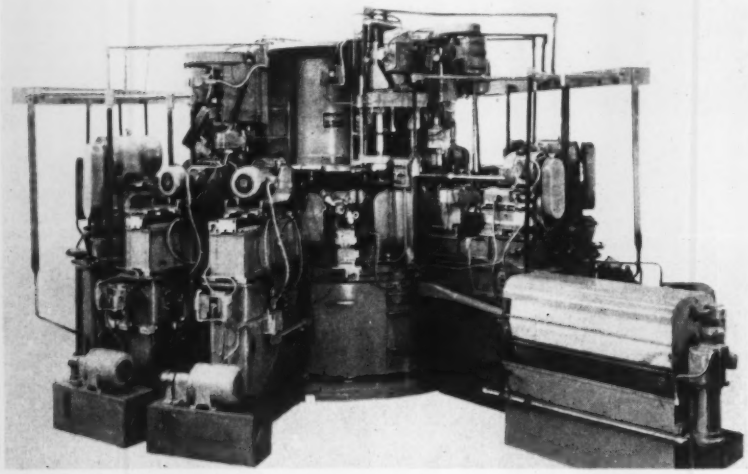
Designed for use in mass production, Turco Fabrifilm is applied upon receipt of raw stock, allowed to remain on the surface during storage, forming, and fabrication, and then completely removed from the surface during subsequent cleaning.

For more information, *write* Turco Products Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

Ultrasonic Units Handle Difficult Cleaning Jobs

DIFFICULT cleaning operations such as heavily soiled gear trains and castings can be handled in a line of ultrasonic cleaners which feature average output powers from 150 to 700 watts and tank capacities from 3 to 8 gallons.

This manufacturer is also introducing a mobile ultrasonic cleaning system, mounted on rubber-tired



THIS HIGH PRODUCTION MACHINE provides fast, easy re-alignment for product model changes, for completely new models, or for other types of products within its size limits. It is performing 74 distinct operations automatically on one-cylinder or two-cylinder refrigerator compressor housings. The 18-station basic center column machine uses an 84 in. hydraulic indexing table. The 74 spindles are mounted on three 8 in. way-type units, eight No. 2 Cam-Matic drill units and 14 Air-Oil-Matic drill units. By incorporating these standard Morris production units, the machine tool eliminates model changeover problems. For more information, **write** Morris Machine Tool Co., Cincinnati, Ohio.

PRICELESS... But It's FREE!

Metallurgical Service at THE HOUSE OF STAINLESS Starts Where You'd Expect It To End

One of the reasons it pays to do business with Chicago Steel Service is the all-out metallurgical assistance that's available to you here without extra cost.

This service is much more than helping you select the type of stainless steel that's best-suited for your application. We're ready to work closely with you to determine the best way for you to work with the stainless selected. Give you help on such operations as machining, welding, soldering, drawing, forming, spinning and other facets of fabrication.

This includes assistance in adapting present equipment for handling stainless steel—along with counsel on set-up and operating procedures. It even can include help in tool design for long tool life and economical production and to assure quality of finished parts.

In short, metallurgical service at The House of Stainless can be as broad and inclusive as you want it and the help you get costs you nothing.

With our complete warehouse stocks, we can make prompt deliveries for normal requirements. Where mill shipments are called for, we are in constant touch with the leading stainless producing mills and can fill your needs at no extra cost to you.

The House of Stainless
CTFI
AT YOUR SERVICE
JILLL

CHICAGO STEEL SERVICE COMPANY

Please phone LAfayette 3-7210

Kildare Avenue at 45th Street, Chicago 32, Illinois • Mailing Address: Box 6308, Chicago 80, Illinois

Milwaukee District Office: 757 N. Broadway, Milwaukee 2, Wisc. Telephone BRoadway 3-7874

Sales Representatives at Bloomington and Rockford, Ill.; Indianapolis and South Bend, Ind.; Davenport, Iowa; Grand Rapids, Mich.; Minneapolis, Minn.; Appleton, Wis.

YOUR DEPENDABLE SOURCE FOR BOTH CARBON AND STAINLESS STEEL

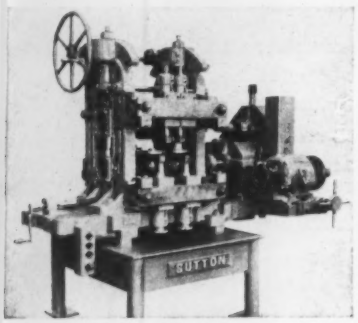
wheels, which can be pushed from one location to another for use wherever electric power is available. Cleaning tanks up to 75 gallon capacity and ultrasonic power generators in ratings up to 2500 watts can be provided.

For more information, *write* Acoustica Associates Inc., 26 Windsor Ave., Mineola, N. Y.

Machine Corrects Contours Of Aluminum Extrusions

CROSS-SECTIONAL distortions of aluminum extrusions can be corrected to extremely close tolerances with the Sutton contour correcting machine. Flat sections up to about 14 in. wide can be handled, and multiple corrections of shapes circumscribed by a 9 in. circle can be made in one pass.

The correcting mechanism consists of two main drive spindles with rolls (which may be used for correcting as well as traction) and up to eight correcting idler rolls (which may be positioned in many different ways on as many as 12 toolholder positions). An almost infinite variety of shapes can be arranged for.



After initial setup, toolholders may be adjusted externally, both vertically and horizontally, by increased or decreased pressure. That feature cuts setup and changeover time and permits more precise correcting than otherwise would be possible.

For more information, *write* Sutton Engineering Co., First National Bank Bldg., Pittsburgh 22, Pa.

NEW literature

Write directly to the company for a copy

Microfilm Booklet

How to index your microfilm records for maximum retrieval efficiency is explained in an 8 page booklet. Advertising Dept., Recordak Corp., Wanamaker Place, New York 3, N. Y.

Cushioning Material Uses

A progress report gives a variety of new applications for Edg-Pak cushioning material for protecting edges of material in nesting and packaging. Edg-Pak Div., Flex-O-Lators Inc., Carthage, Mo.

Heat Exchanger Design

"Design and Cost Comparison of Heat Exchangers Using Wolverine Trufin," 19 pages, explains how integral finned tube should be used and how it affects the design of heat exchangers and fouling factors. Wolverine Tube Div., Calumet & Hecla Inc., 17200 Southfield Rd., Allen Park, Mich.

Tap Reference Charts

A new booklet contains charts and tables on tap size selection, complete information on class of fit, limit numbers, gage data, tap-drill and thread-engagement data for all common materials. Besly-Welles Corp., South Beloit, Ill.

Abrasive Tumbling

A technical paper by H. R. Letner discusses the "Stress Effects of Abrasive Tumbling." Mellon Institute, 4400 Fifth Ave., Pittsburgh 13, Pa.

Stainless Steel Tubing

A brochure describes PH 15-7 molybdenum tubing and lists the chemical composition, applications, size limits, and standard heat treatments. Ask for Special Analysis Memo No. 120. Superior Tube Co., 1585 Germantown Ave., Norristown, Pa.

Gun Drill Data

A 16 page booklet describes the requirements and advantages of gun drilling. Cleveland Twist Drill Co., 1242 E. 49th St., Cleveland 14, Ohio.

Reference Booklet

"Convenient Tables and Formulas" includes 120 pages of tables, formulas, and graphic symbols summarizing electrical data, properties of materials, heat transfer and steam information, measurements, and other subjects. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

Aluminum Machining Data

"Automatic Screw Machining of Aluminum," 32 pages, contains data on all phases of the light metal's use in this operation. Dept. PRD-10, Reynolds Metals Co., Box 2346, Richmond 18, Va.

Aluminum Welding

A 120 page handbook gives a comprehensive survey of the techniques of welding aluminum using Aircomatic (gas shielded, metal arc) and Heliweld (tungsten, inert gas) processes. Air Reduction Sales Co., 150 E. 42nd St., New York 17, N. Y.

Aluminum Hand Forgings

A 20 page brochure lists availabilities, properties, and engineering information for hand forgings. Kaiser Aluminum & Chemical Sales Inc., 919 N. Michigan Ave., Chicago 11, Ill.

Polyvinyl Plastisols

A paper illustrates four examples of the use of polyvinyl plastisols for production economies and ease of fabrication. Chemical Products Corp., East Providence, R. I.

Dry Lubricant Handbook

A handbook assists in specifying dry film lubricants properly. It points out good applications and those not recommended. EverLube Corp., 6940 Farmdale Ave., North Hollywood, Calif.

NEW BOOKS

Welding Handbook, Section II, American Welding Society, 33 W. 39th St., New York 18, N. Y. 550 pages, $9

The second section of this fourth edition covers gas, arc, and resistance welding processes, and includes a chapter on standard welding symbols. A chapter is devoted to each process, or group of processes, and each group is followed by a chapter describing the equipment.

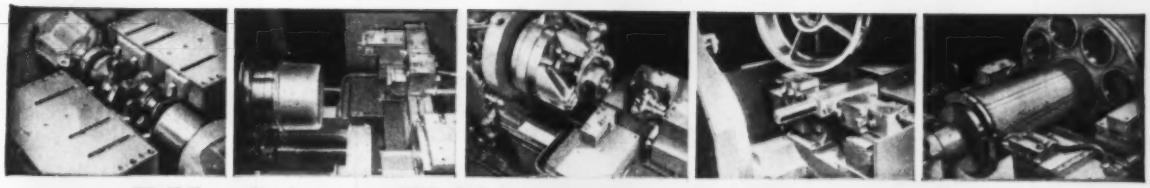
Fine Particle Measurement, Clyde Orr Jr. and J. M. DallaValle, Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 353 pages, $10.50

Important techniques being used in research laboratories for measuring size, surface, and pore volume are discussed in detail. Treating both the theory and application of these measurements, the authors provide a comprehensive description of more than 70 techniques, including automatic scanning, the fixed-time method, the Hauser-Lynn method, gravimetric analysis, and liquid-phase sorption. A bibliography of about 400 references complements the text.

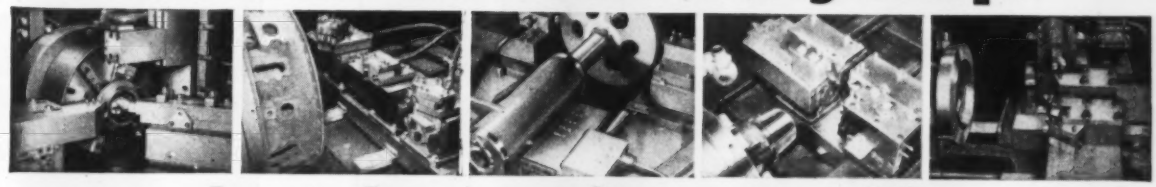
Mathematical Programming, Nyles V. Reinfeld and William R. Vogel, Prentice-Hall Inc., Englewood Cliffs, N. J. 274 pages, $8

Written for the average industrial manager, this work uses examples culled from everyday management problems to illustrate the methods of mathematical programming, using a minimum of mathematics.

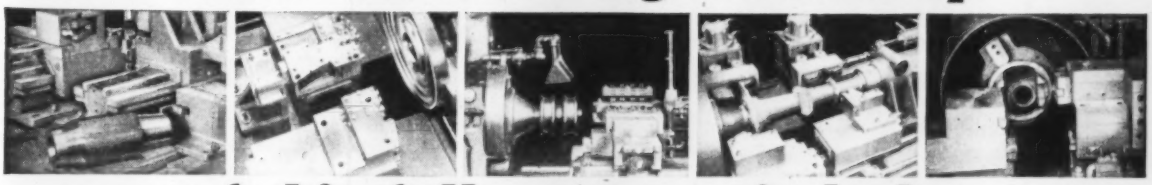
The reader will find, too, that the examples are valuable in drawing parallels with problems not specifically covered or explained in the book.



All these different tooling setups



show the amazing versatility



# of this fully automatic lathe

...the SIMPLIMATIC

Here's versatility that beats any automatic lathe you ever saw! Actually, the Simplimatic is doing hundreds of jobs like these—jobs that would otherwise be put on *special* machines—built at extra-special cost. But this (and don't miss the important point!) is a *standard machine*—at a *standard price.*

If you have medium or long runs on parts up to 3 1/4" in diameter, get the facts about the Simplimatic Automatic Lathe.

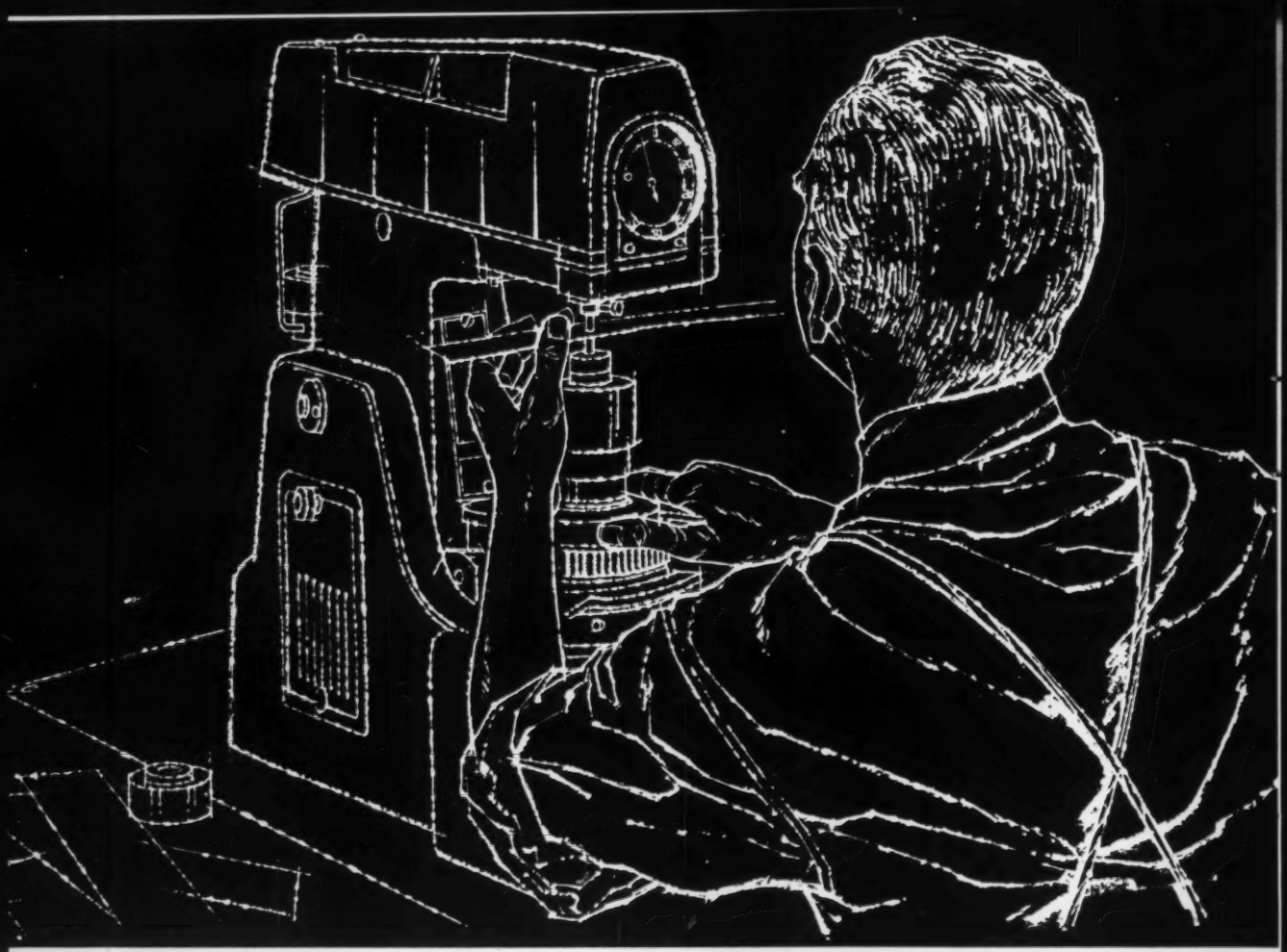
GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin

THIS CATALOG may show you how the Simplimatic can save thousands of dollars for you as it is doing for many others. Write for your copy.

Gisholt Machine Co.
Madison 10, Wisconsin
Gentlemen:
Please send my copy of the Simplimatic Catalog.

Name.....*Title*.....
Company.....
Address.....
City.....*Zone*....*State*.....

ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY-REBUILT MACHINES WITH NEW MACHINE GUARANTEE



PRECISE HARDNESS CONTROL

to your specifications with

J&L Cold Rolled Strip Steels

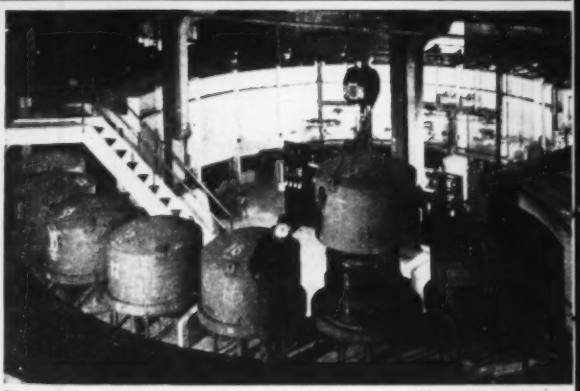
Variations within standard commercial limits of hardness for strip steels may not provide the quality needed for most critical applications.

At J&L the newest equipment and techniques are used to provide controlled hardness—to your specifications.

Basic oxygen converters, high standard open hearth practice and electric furnaces provide optimum melting conditions, new hot strip mills are specifically designed to produce the finishing temperatures needed for inherent quality. Cold mills, annealing and normalizing furnaces and other equipment are designed specifically for precision strip steel processing.

With an organization experienced in specialized strip steel processing, your most rigid specifications can be met consistently.

For your convenience, precision strip facilities are available to you in our plants at Youngstown, Indianapolis, Los Angeles and Kenilworth (N. J.)



The small unit rotary annealing method assures precision temperature control and develops optimum hardness and microstructure for high carbon, low carbon and alloy strip.

J&L STRIP

LOW CARBON • HIGH CARBON • ALLOY • STAINLESS
TEMPERED SPRING STEEL • ZINC AND COPPER COATED

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Youngstown 1, Ohio

June 29, 1959

Barring Strike, Third Quarter Looks Good

LOOK FOR steelmaking operations to average 65 per cent of capacity during the third quarter if there's no strike or if it's very short.

Production will be about 24 million tons; finished steel shipments, about 18 million. Although operations will drop 26 points from the second quarter's 91 per cent rate, they'll still beat last year's July-September average.

FASTER CONSUMPTION— The third quarter looks much brighter than the corresponding period in 1958 because there has been a turnabout in consumption. A year ago, business was in the throes of recession. Consumers were still liquidating their inventories. Today, with economic indicators at record heights, demand for steel is stronger across the board. Consumption is up considerably in nearly all the major markets: Automotive, construction, appliances, railroads, pipelines, and containers.

USERS READY FOR STRIKE— Although they've not been able to accumulate as much steel as they wanted, most consumers are adequately protected against a four week strike. Trouble will start when stocks get out of balance, probably after six weeks. Since Jan. 1, users' inventories have jumped from 13 million to 21 million tons. But even so, they're about 4 million tons smaller than they were on the eve of the 1956 walkout.

FEW CANCELLATIONS— If labor and management can agree on a new contract by June 30, averting an industry shutdown, third quarter cancellations will be relatively few. Steelmakers estimate that they'll lose between 5 and 15 per cent of their tonnage, the bulk of it in August and September. July will be a strong month for two reasons: 1. Carryovers from June will be sizable. 2. By the time the labor situation has been clarified it will be too late to cancel July tonnage. Third quarter consumption will be about 20 million tons (vs. shipments of 18 million). Net inventory reduction: About 2 million tons.

HOW PRODUCTS WILL SELL— Barring a strike, steelmakers will operate close to capacity on flat-rolled products during the third quarter. Demand is highly diversified, and many small users will be looking for tonnage that they couldn't pick up in May and June. Galvanizers will operate at maximum speed to meet the requirements of building contractors, distributors, and automakers. Tin plate production will be at 70 to 75 per cent of capacity. Wide flange beams and sheared plates will prosper, thanks to construction and railroad carbuilding. Line pipe will be produced at capacity as natural gas transmission companies continue their expansion programs. Standard pipe will do well because of construction requirements. Oil country goods and hot-rolled bars will feel the brunt of inventory reduction.

INGOT RATE SLIPS— Last week, scheduled steelmaking operations fell 2.5 points to 90 per cent of capacity as wildcat strikes hit the industry. Production was about 2,548,200 net tons of steel for ingots and castings. First half output was the highest in history: 64 million ingot tons. Best previous production was the 62.6 million tons turned out in the first half of 1956.

WHERE TO FIND MARKETS & PRICES

	News	Prices
Bars, Merchant	111	116
Reinforcing	111	117
Boiler Tubes	...	*
Canada	111	124
Clad Steel	...	122
Coke	...	124
Coal Chemicals	...	124
Charts:		
Finished Steel	...	115
Ingot Rate	114	...
Scrap Prices	...	127
Comparisons	...	115
Contracts Placed	133	...
Contracts Pend.	133	...
Electrodes	...	*
Fasteners	...	121
Ferroalloys	112	125
Fluorspar	...	124
Footnotes	...	121
Imported Steel	...	124
Ingot Rates	114	...
Metal Powder	...	124
Nonferrous Met.	130	132
Ores	...	124
Pig Iron	113	123
Piling	...	116
Plates	112	116
Plating Material	...	133
Prestressed Strand	...	121
Price Indexes	...	115
Producers' Key	117	...
R.R. Materials	...	121
Refractories	...	124
Scrap	126	128
Semifinished	114	116
Service Centers	113	123
Sheets	111	117
Silicon Steel	...	118
Stainless Steel	...	122
Strip	111	118
Structurals	112	116
Tin Mill Prod.	111	118
Tool Steel	...	122
Tubular Goods	111	122
Wire	127	118

*Current prices were published in the June 22 issue and will appear in subsequent issues.

Metalworking Outlook—Page 39 Technical Outlook—Page 79

Molybdenum Markets Expand

ARC CAST MOLYBDENUM and alloy mill shapes have grown into a 600,000 lb annual market—a gain of around 50 per cent in the last three years. As its properties become more controllable, moly's common markets will expand, but it will face stiffer competition from other rare metals for special missile and atomic energy applications.

At least a dozen firms fabricate the metal in special forms, but only three are casting ingots in consumable electrode furnaces.

Largest capacity is at Climax Molybdenum Co.'s 23,000 sq ft plant in Coldwater, Mich. Its two furnaces can turn out 1 million lb of castings yearly. The firm produces cast ingots, turned extrusions, and forging billets at Coldwater. It also markets rolled and sheet bars, sheets, and plates. It has just adopted a new tradename, Climelt. The firm has enough space to add more integrated fabricating equipment when demand warrants it.

Universal Cyclops Steel Corp.'s Refractomet Div., Bridgeville, Pa., has an integrated setup to make castings, forgings, sheets, plates, and bars. Its arc cast furnace has an annual capacity of about 500,000 lb. Refractomet also uses the furnace to melt other rare metals (tantalum, columbium, zirconium).

At Bridgeport, Pa., Westinghouse Electric Corp. has cast some ingots and formed wrought products for a few of its customers. But the company apparently has no plans to become a volume producer.

• **Where Moly Goes**—Missilemakers are the biggest current users of molybdenum. They account for more than half the total market. They put the metal into jetavators, liners, and missile nozzles.

Moly is used by atomic energy people for tubing in heat exchangers. Cathodes, cathode supports, and plates are made from the metal for the electronic industries. Furnacemakers put moly into radiation shields, heating elements, boats, and trays.

The tool and die industry uses it for piercing points for seamless tubing production, boring bars, and cores for brass diecasting. Moly goes into stirrers, electrodes, and parts subject to erosion by hot glass, in the glass industry. Chemical manufacturers use it in the production of sulfuric, hydrochloric, phosphoric, and hydrofluoric acids.

• **Will Go Farther**—It's pretty certain that markets will expand as properties become more predictable. Today, most wrought products are sold on the basis of reliability, not price. Universal and Climax do offer price lists on standard products, including the newer molybdenum-titanium alloys which are becoming more popular than unalloyed shapes. Unalloyed rounds 3¼ to 3½ in. in diameter sell for $12 to $44 a pound in lots over 4000 lb. Although prices are quoted on sheets, their properties still aren't easily controlled. Two developments may improve sheet quality and boost consumption:

1. Refractomet expects to put its "Infab" (inert atmosphere) room into use late this year. It's filled with argon to permit working moly and other rare metals at higher temperatures without excessive oxidation. Presently, the metal is rolled at around 2200 to 2400° F, although its best working temperature appears to be nearer 3000° F.

2. Chromalloy Corp., White Plains, N. Y., has been active in coating molybdenum sheet bars prior to rolling. This also shows promise in preventing oxidation during forming operations.

• **Competition**—Other molybdenum fabricators have been able to develop sintered rounds up to 6 in. in diameter. Although the sintered products don't have the strength of wrought rounds, they are acceptable for some applications and cost only half as much. The market for sintered products is about 1.4 million lb a year.

• **Making Moly**—Climax feels its facilities have taken molybdenum from the laboratory to the commercial level. The melting process is a critical operation. Powdered metal is blended with chips from turning operations. Graphite is added as a deoxidizing agent. Other alloying ingredients (titanium and zirconium are most common) are blended into the basic powder.

The blend is shaken into a six

Steel Improvement & Forge Co.

Formation of trioxide (the gas around the work) is one of the problems of forging molybdenum. In this installation, fan (background) exhausts oxide

sided die (three sides are moveable). A piston packs the powder into a pellet at about 12,000 psi. At the end of the piston's stroke, side pressure on the die is released and the pellet is pushed down toward the mold base. When a pile of pellets is built up, they're sintered into an electrode at 1500 to 2500° F. The electrode is pushed farther into a double walled copper mold that's 12 by 40 in.

• **Arc Cast**—Some 40 to 50 lb of moly chips are placed on the base block so an arc can be struck upon contact of the electrode with the chips. Melting temperatures range between 5000 and 5500° F, depending on the alloys used. It takes about 90 minutes to melt a 2000 to 2500 lb ingot.

After the melt is completed, the molds are swung out and water cooled for an hour, so the ingot can shrink before being stripped. Rough cast ingots are turned down to fit extrusion containers. Climax and Universal send their ingots to Canton Drop Forge Co., Canton, Ohio, for extrusion into billets.

When the billets return, Climax recrystallizes them in a gas fired furnace under a reducing atmosphere to avoid further oxidation. Billets are straightened in a 600 ton press, cleaned in a caustic solution, and machined to clean the surface.

Billets are inspected ultrasonically and with a nondestructive penetrant (Zyglo).

Canadian Steelmakers To Improve Their Plants

Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., plans Canada's first wide flange beam mill. Costing $15 million, it will produce beams up to 24 by 12 in., with maximum weight of 190 lb per foot. The works, to be built by Dominion Engineering Co., Montreal, will consist of a 50 in. universal roughing mill and a 36 in. edging mill, set up in tandem, as well as a 50 in. universal finishing mill.

A continuous reheating furnace and the present 32 in. breakdown mill will supply the new mill and the rail and structural mills with steel.

Dominion Steel & Coal Corp. Ltd., Sydney, N. S., plans to spend $13 million on enlargement of its blooming mill.

Steel Bars . . .

Bar Prices, Page 116

Some large producers of finished steel products say their arrearages in merchant bars will run heavier than in most of their other lines. While more tonnage is going into sheets, the mills can't maintain good rolling schedules in bars due to the necessity of making changes in rollings.

It's estimated that hot rolled carbon bar carryovers at the end of this month will average at least three weeks' production, possibly more, in the opinion of some makers.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 117

Some producers of reinforcing steel bars report they are entertaining the best volume of business they have had in years. At St. Louis, for example, sellers describe the push for rebars as "fantastic," with larger tonnage being shipped than ever before and users' needs still being far from satisfied.

Explanation for the strong push is found in the fact that many contractors started jobs simultaneously this year, and, fearing a July strike shutdown, they have been taking deliveries steadily in recent months. But there's not much storing of building bars since most of the tonnage shipped by the mills has gone into current construction programs.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 117 & 118

Wildcat strikes cut into sheet production last week. Jones & Laughlin and Republic Steel were hit early in the week by unauthorized walkouts.

The sheetmakers have been pushing shipments at a record pace. With the USW official strike deadline only a few days away, pressure from consumers has reached fever pitch. Fortunately, transportation problems haven't been as serious as some trafficmen had feared. But the mills are running behind schedule on deliveries, carryovers of at least ten days to two weeks being indicated for the end of the month. The carryover on cold rolled sheets may run as much as three weeks; in galvanized sheets, it may run a month or more.

Although major consumers, such as the automotive and appliance industries, have big (60 to 90 day) inventories, many small users will be hard hit if there's a strike lasting more than three or four weeks.

General Stores Supply Office, Navy, Philadelphia, closes July 7 on 630 tons of carbon sheets, and 680 tons of steel strapping.

The Department of Administration, State of Washington, has called bids July 7 for furnishing about 112,000 vehicle license plates, steel tonnage not stated.

Tin Plate . . .

Tin Plate Prices, Page 118

Tin plate producers are being pressed by consumers to ship as much of their orders as possible before July 1. In the Pittsburgh district some mills are about ten days behind on shipments, partly because of mechanical failures.

"When you've been running your equipment at top speed for months, breakdowns are inevitable," comments one product manager.

Planning of some users is another source of trouble. Some buyers underestimated their consumption when they placed orders three months ago. Others failed to order what they'd need most.

Tubular Goods . . .

Tubular Goods Prices, Page 122

No letdown in demand for mechanical and pressure tubing is reported. Consumers are clamoring for deliveries before the July 1 strike deadline. Fortunately for those with low stocks, only about half the industry would be shut down by a strike.

Although strike hedging is an important factor, steelmakers think much of the tonnage is being ordered for immediate use. In the last two months, sales to farm machinery manufacturers have improved markedly. Large shipments are also being made to machine shops and producers of automotive parts, hydraulic cylinders, and railroad journal bearings.

Specialty tube users are placing orders for the third quarter as they would if labor conditions, were more settled. Limited quantities of mechanical tubing are still available for August delivery, but order books

are filling fast. Producers expect to operate at 70 to 75 per cent of capacity during the third quarter.

Pressure tubing suppliers are offering early August delivery. Demand is stronger than it was in the second half of 1958, but no big improvement is expected before next year. Because of the strike threat, boiler manufacturers have compressed their requirements for nine months into six. But they've bought only against jobs for which they have firm contracts.

Plates . . .

Plate Prices, Page 116

It's estimated that the plate mills will have a carryover of about three weeks' production, on the average, at the end of this month. While new orders are off, due chiefly to the uncertain labor outlook in the steel industry, considerable tonnage is being fabricated. If there's no steel strike, activity should be better than fair throughout the summer.

Demand from the oil and gas industry is increasing. Building requirements are also up, and indications are that railroad needs will continue strong.

The recently noted list of 4000 seventy-ton hoppercars to be built at Johnstown, Pa., by Bethlehem Steel Co. for the Pennsylvania Railroad will require 80,000 tons of steel, including a substantial tonnage of plates. That list completes the Pennsylvania's program for acquiring 23,500 freight cars, with the great bulk of the work yet to be fabricated.

Ferroalloys . . .

Ferroalloy Prices, Page 125

Chromium Mining & Smelting Corp. Ltd., Toronto, Ont., plans plant and equipment expansions costing $2 million. The company, which produces chromium and silicon alloys, will make its facilities at Beauharnois, Quebec, more flexible. More than half its planned expenditures will be for improvements at the company's smelter at Memphis, Tenn.

Structural Shapes . . .

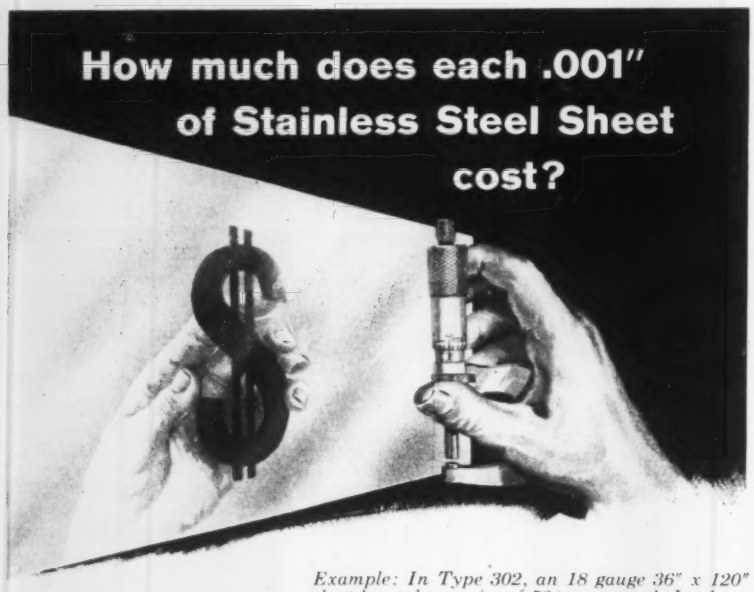
Structural Shape Prices, Page 116

The Bonneville Power Administration last week said its recent call for bids involved 14,000 to 15,000 tons of tower steel, and that an Italian firm, Societa Nomina Electrificazione, Milano, Italy, was low on all schedules.

A partial award of 8600 tons of fabricated steel was made. The remaining 5700 tons are expected to be placed when funds are available for construction in the new fiscal year.

Specifications require that all lettering and detailing conform with U. S. manufacturing standards, and the towers must be interchangeable with steel fabricated by U. S. companies. The contract covers all the requirements for the Rocky Reach-Maple Valley and the Big Eddy-McLaughlin transmission lines, with a few towers scheduled for the Chief Joseph-Snohomish line.

A 14 day wildcat strike at the Chicago structural steel fabricating plant of Bethlehem Steel Co. ended June 19. The plant employs 250 members of the USW. The company had suspended more than 60



Example: In Type 302, an 18 gauge 36" x 120" sheet has a base price of 52¢ per pound. In sheets of this size, each .001" of thickness weighs 1.26 pounds per sheet. Thus, each .001" of unnecessary thickness costs you at least 65.5¢ more per sheet.

On the surface this may seem insignificant, but it has a marked effect on the total price you pay for a given quantity of stainless steel sheet. With cost a factor, this can be important since stainless steel is purchased by weight.

Using the above example, a mere .001" of unnecessary thickness costs you $20.76 more per ton. If you figure the maximum allowable gauge thickness variation of plus or minus (10%), you can readily see that the price you pay for overall sheet thickness could involve much needless cost.

Washington Steel has the equipment and the experience to produce MICRO-ROLD stainless steel to tolerances much closer than standard industry tolerances. Usually money can be saved by first selecting the minimum gauge that will serve the requirements of the application, and then specifying that the thickness be rolled to the light side of the gauge range. This specification involves no cost extra and is standard practice at Washington Steel. (If exact close tolerances must be guaranteed, there is a nominal additional charge.)

Consult your nearest MicroRold Stainless Steel Distributor. He will gladly show you how to save money on your stainless steel purchases.

Washington Steel Corporation

600 Woodland & Griffith Avenues

Washington, Pa.

workers for participating in the unauthorized strike and for picketing.

Byers Sets Up Network Of Distribution Centers

A new distribution network has been established by A. M. Byers Co., Pittsburgh, providing for nationwide distribution of its electric furnace alloy and stainless steel products. A. S. Chalfant, vice president-sales, says service will be improved to customers as the new sales network will enable them to order both warehouse and mill quantities from the same source. Faster deliveries are also assured.

Under the plan, the U. S. is divided into four territories: Far West, Southwest, Midwest, East. The Far West is served by Shultz Steel Co., South Gate, Calif.; the Southwest by Schill Steel Co., Houston; the Midwest by Tech Steel & Alloy Corp., Chicago; the New York area by International Steel Corp., Hillside, N. J.; and the Philadelphia area by A. Milne & Co. Inc.

Distributors . . .

Consensus among operators of steel service centers is that sales in June will reach a new peak for the first half. Buying has been brisk, not only for current consumption but for stock needed for maintenance and repairs a little later in the summer.

A three week strike at Steel Sales Corp., Chicago, ended June 22. The 100 strikers at this steel service center returned to work after approving a 10 cent an hour pay raise and improved pension benefits. The contract with the United Steelworkers runs through May 31, 1960.

Pig Iron . . .

Pig Iron Prices, Page 123

While June business in merchant pig iron has been good, some sellers believe it will not quite reach last month's peak. Most consumers, especially the large ones, have built up inventories to the point where they are fairly comfortable.

However, quite a bit of iron is being consumed. A considerable reduction in melting schedules will become effective in July as a result of mass vacations and hot weather.

THIS IS A DRILL JIG

THE FASTEST, LOWEST-COST DRILL JIG IN METAL WORKING TODAY

Using tape controls to cut tooling costs is a fact.

Ask us to prove it. We will program your parts and demonstrate.

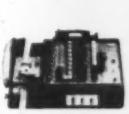
Details and photographs of a variety of parts, compared with conventional machining costs, are available on request. Growing savings and greater profits from new applications are coming in every day.

The Complete Standard System

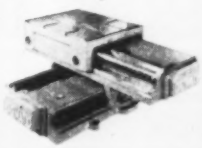
The DIGIMATIC* MODEL 202 Control System includes all equipment necessary for numerical control of point positioning operations.

- **Special Punch Tape Preparation Unit** that is as simple to operate as an adding machine. No complicated computer language to learn.
- **Control Console**—a compact unit, operator-maintained, with shop-proven reliability.
- **Servo Table**—adapted to drilling machines in one day. Automatic positioning on ball bearing ways. Anti-backlash lead screws.

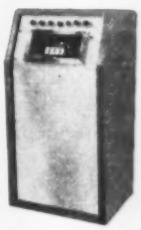
Write for free 12-page booklet "DIGIMATIC MODEL 202." Also—movies shown at your shop or plant on request.



Tape Unit



Table



Control Console

*DIGIMATIC IS OUR TRADEMARK

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

1489 N. GOODMAN STREET • ROCHESTER 3, N.Y.

S-C | G-D

The lull probably will continue through August, but in somewhat lesser degree.

Some operators started banking their furnaces late last week as protection against the possibility of a strike. Others will shut down for repairs in July whether or not a strike is called.

Blast Furnace Production In May Breaks Record

Blast furnace production (pig iron and ferroalloys) set a monthly record during May at 7,747,996 net tons, reports the American Iron & Steel Institute. The former record of 7,510,051 tons was established in March. In April, output was 7,392,606 tons and in May, 1958, it was 4,073,717 tons.

In the first five months of this year output totaled 35.1 million net tons vs. 21.3 million in the same period a year ago. April production by states follows:

Blast Furnace Production—May, 1959
(Net tons)

By State:	May Output	Year To Date
Massachusetts New York	496,087	2,195,129
Pennsylvania	2,061,560	9,188,441
Maryland, Virginia, West Virginia	656,078	3,021,690
Kentucky, Tennessee, Texas	159,561	773,574
Alabama	474,893	2,009,535
Ohio	1,476,963	6,659,369
Indiana	871,589	4,130,939
Illinois	647,956	2,965,569
Michigan, Minnesota	488,026	2,256,473
Colorado, Utah, California	415,283	1,903,001
Total	7,747,996*	35,103,720**

* Includes 64,237 tons of ferromanganese and spiegeleisen.

** Includes 260,608 tons of ferromanganese and spiegeleisen.

Data from American Iron & Steel Institute.

Steel Rate Off but Less than Expected

STEEL INGOT production last week held up remarkably well with the strike deadline only a few days away. Preliminary figures indicated operations for the week averaged 90 per cent of capacity, off only 2.5 points from the week preceding. Output was estimated at 2,548,200 tons.

While production was the smallest for any week since that ended Feb. 23, it was remarkably high in light of anticipated curtailments by wildcat strikes and management preparations for a possible July 1 shutdown. However, only two major wildcat suspensions were reported up to last midweek: One at Jones & Laughlin's Pittsburgh Works, and one at Republic's strip mill at Cleveland.

• **Dispute Incentives** — Jones & Laughlin's strike was a dispute over incentive rates. It immediately idled 1800 workers in the Open Hearth Dept., and forced the company to put its Eliza blast furnace on a standby basis. It was thought pickets would force suspension of hot rolled, cold rolled, and galvanized sheet production.

At Cleveland, Republic was forced to close its 98 in. hot strip mill and three cold rolling mills early last week. A workman on the zinc plating line was sent home for refusing to perform his usual duties. A wildcat strike followed.

Few other production slowdowns or harassments by workers have been reported. At Chicago, a 14 day wildcat strike at the structural steel fabricating plant of Bethlehem Steel Co. ended June 19. Also, at Chicago, a three week strike at the Steel Sales Corp. service center ended June 22, the workers returning after receiving a 10 cent per hour pay raise and improved pension benefits.

• **Transport Adequate**—Fortunately, the mills haven't been plagued with transportation problems during recent weeks and have been able to ship maximum volume. One Chicago mill comments that service from the railroads and truckers is on a par with other periods when the mill has operated at a rate as high as at present. Shipments of one of the larger midwestern mills in 1958 were: 51 per cent by truck, 43 per cent by rail, and 6 per cent by water.

Semifinished Steel . . .

Semifinished Prices, Page 116

It appears most mills will produce steel as long as they can before closing down for a strike. They intend to ship rolled products right up to the strike deadline.

If a strike's averted, it's thought some tonnage ordered for third quarter may be canceled, or pushed into fall rolling schedules. However, sufficient business will be carried over from second quarter to assure July steelmaking and rolling operations close to capacity.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

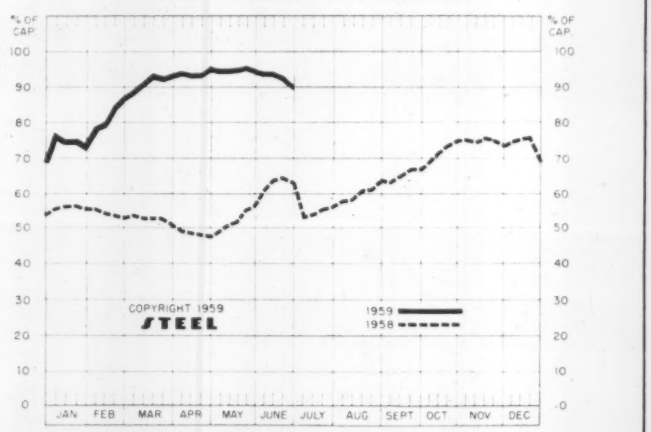
	Week Ended June 28	Change	Same Week 1958	Same Week 1957
Pittsburgh	82	—15	59	91
Chicago	94.5	— 1*	66.5	84.5
Eastern	93	— 2	62	93.5
Youngstown	92	0	49	80
Wheeling	90	+ 1.5	70	82.5
Cleveland	96.5	+ 2.5*	50	89.5
Buffalo	107.5	0	44	102.5
Birmingham	92	0	68	92.5
Cincinnati	96	+ 1.5*	66	79.5
St. Louis	98.5	+ 9*	85.5	79
Detroit	93	— 2.5*	66.5	114
Western	94.5	— 2.5	74	100
National Rate	90	— 2.5	63	86

INGOT PRODUCTION‡

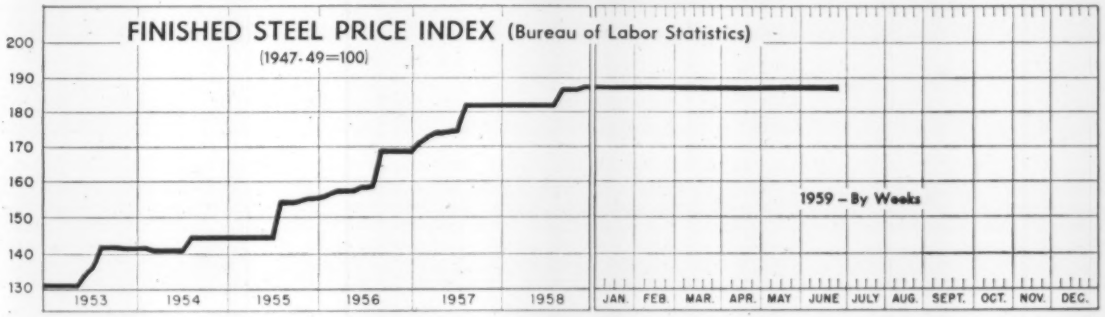
	Week Ended June 28	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	163.5†	163.1	165.0	103.7
NET TONS (In thousands)	2,627†	2,620	2,650	1,666

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



June 23, 1959	Week Ago	Month Ago	May Avg.	Year Ago
186.7	186.7	186.7	186.7	181.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 23

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.533
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.665
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.722
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	June 24 1959	Week Ago	Month Ago	Year Ago	5 yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.75
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.52	$113.20
No. 2 Fdry. Pig Iron, GT.	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	36.50	36.50	34.00	35.00	27.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 24 1959	Week Ago	Month Ago	Year Ago	5 yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.15	5.65
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate(1.50 lb)box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods 7/32-9/32" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton	June 24 1959	Week Ago	Month Ago	Year Ago	5 yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt Pittsburgh	$36.50	$35.50	$34.50	$35.50	$29.50
No. 1 Heavy melt E. Pa.	38.00	38.00	33.50	34.00	23.00
No. 1 Heavy Melt, Chicago	35.00	35.00	34.00	35.00	31.00
No. 1 Heavy Melt, Valley	39.50	39.50	37.50	36.50	28.50
No. 1 Heavy Melt, Cleve.	36.50	36.50	35.50	33.00	27.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	31.50	26.50	26.50
Rails, Rerolling, Chicago	59.50	58.00	57.50	52.00	44.50
No. 1 Cast, Chicago	52.50	50.50	49.50	39.50	38.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, June 24, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 117; footnotes, page 121.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$76.00

INGOTS, Alloy (NT)

Detroit S41 .....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)

Bartonville,Ill. K4 ...$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 .....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)

Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 .....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 .....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 .....109.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14 .99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ...119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14.119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 .....122.50

SKELP

Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

WIRE RODS

AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 .....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
N.Tonawanda,N.Y. B11.6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14 ..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes

AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 .....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange

Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 .....5.50
Sterling,Ill. N15 .....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes

Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes

Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....8.05

H.S., L.A., Wide Flange

Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05
Sterling,Ill. N15 .....7.75

PILING

BEARING PILES

Bethlehem,Pa. B2 .....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel

AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ..5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1.5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 .....5.30
Youngstown (27) R2 ..5.30

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ....7.05
Fontana,Calif. K1 .....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron

Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.

Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1.7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy

Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 .....7.50
Coatesville,Pa. L7 .....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 .....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 .....7.50

FLOOR PLATES

Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
S.Chicago,Ill. U5 .....6.375

PLATES, Ingot Iron

Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 .....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta (9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O. (23) R2 .....6.15
Clairton,Pa.(9) U5 ..5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif. J7 ....6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1.5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 .....6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11.6.375
Pittsburgh(9) J5 .....5.675
Portland,Oreg. O4 .....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14 ..6.425
S.Ch'e'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ...5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11.6.375
Warren,O. C17 .....6.025
Youngstown(9) R2, U5.5.675

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.725
Bethlehem,Pa. B2 .....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 .....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 .....7.375
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 .....7.775
Lowellville,O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 .....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R.
High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 .....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C.F. Leaded
(Including leaded extra)
Carbon

LosAngeles P2, S30 ..11.75*

Alloy

Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 .....10.175
Newark,N.J. W18 .....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2.7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 .....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ...7.65
Gary,Ind. R2 .....7.65
GreenBay,Wis. F7 ....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 .....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2.9.10
Mansfield,Mass. B5 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 .....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill. A7 .....7.65
Willimantic,Conn. J5 ..8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon
(Turned and Ground)

Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 .....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 .....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. B5 .....9.025
Lackawanna,N.Y. B2..9.025
LosAngeles P2, S30 ..11.00
Mansfield,Mass. B5 ..9.325
Massillon,O. R2, R8 ...9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ..9.225
Worcester,Mass. A7 ..9.325
Youngstown F3, Y1 ..9.025

BARS, Reinforcing, Billet (To Fabricators)
AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)
Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ...7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron
Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel
ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ...5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)
AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1..5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)
Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy
Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 ....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 ....7.525
Fairfield,Ala. T2 ....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)
Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron
Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)
AlabamaCity,Ala. R2 .6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 ....6.275
Conshohocken,Pa. A3..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ...6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ...9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron
Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped
AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ...6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing
Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy
Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel
Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)
Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized
Cleveland(28) B2 ....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated
Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron
Ashland,Ky. A10 ....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 ....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage
Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)
BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div., U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H.K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons,John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago,Ill. W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark, Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80
Weirton,W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C. R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)			
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††	
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

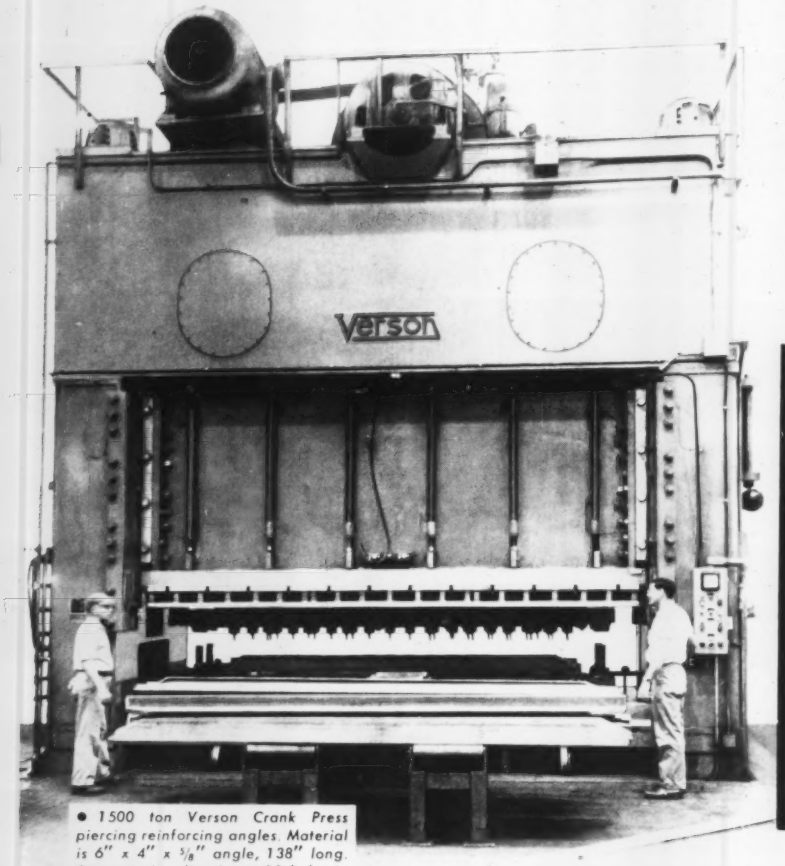
Call Crucible for stainless of uniform excellence

The lustre of Crucible stainless is achieved through precision-rolling on modern mills. Uniform physical properties are maintained by checking each heat — while electronic measuring controls ensure accurate gauge. Such methods produce coil after coil of uniform excellence. For stainless in all gauges down to .010" and in all strip widths, call or write: Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.

CRUCIBLE STEEL COMPANY OF AMERICA

CANADIAN DISTRIBUTOR — RAILWAY AND POWER ENGINEERING CORP., LTD.

You can have versatility in a big press



• 1500 ton Verson Crank Press piercing reinforcing angles. Material is 6" x 4" x 5/8" angle, 138" long. A two-station die pierces 18 holes in one leg, 14 in the other.

THIS Verson CRANK PRESS PERFORMS UP TO FOUR OPERATIONS SIMULTANEOUSLY

Descriptive bulletins are available on all Verson equipment. Write mentioning the type of equipment you are interested in.

While most people think of press versatility in connection with smaller presses, you can get versatility in big presses if you need it. You can get it, that is, if the press builder understands your production problems.

The Verson 1500 ton double crank press shown above is a good example. Installed in the Decatur (Ill.) plant of Caterpillar Tractor Co., it's a big press (bolster area 72" x 192", over 31' high, and weighing more than 180 tons). It operates at 16 strokes per minute. It is designed to J.I.C. specifications and features Verson Automatic Cascade lubrication to all points of the press. It is used for blanking and piercing on a wide variety of construction equipment parts, with as many as four operations performed simultaneously.

Most important, though, it fits the production processes of the plant in which it is used. And we at Verson believe the process is more important than the press.

If you would like to see what production-consciousness can mean to you, ask your Verson representative to go over your requirements with you. It could be the first step to bigger profits.

Originators and pioneers of allsteel stamping press construction

224

VERSON ALLSTEEL PRESS CO.

Verson

9318 S. Kenwood Avenue, Chicago 19, Illinois • 8300 S. Central Expressway, Dallas, Texas

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16,	12.35
Palmer,Mass. W12	12.65
Pawtucket,R. I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity, Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S. Chicago,Ill. R2	173
SparrowsPt. Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
Sparrows Pt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago, Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
PittsburgCalif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2.	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190‡
Atlanta A11	198‡
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196‡
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196‡
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198‡
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190‡
Atlanta A11	192‡
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190‡
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Galv. Store	Galv. Store
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65‡‡
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75‡‡
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage) An'ld Galv.

Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325‡‡
Atlanta(48)A11	9.10 9.775‡‡
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80‡‡
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80‡‡
Johnstown(48) B2	9.00 9.675‡‡
Joliet,Ill. A7	9.00 9.55†
Kans.City(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625‡‡
Monessen(48) P7	8.65 9.35‡‡
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775‡‡
St'ling(1)(48)N15	9.00 9.70‡‡
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50. †5c. ‡10c. ‡‡Less than 10c. ††10.50c. ‡‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)

⅛ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1¼ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread)& Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

½ in. diam	50.0
⅞ in. diam	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy
Hot Pressed & Cold Punched:

¼ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¼ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:
¾ in. and smaller, 6 in. and shorter +85.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter + 5.0
Longer than 6 in. +29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85, ⅞ in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.40	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	28.95	43.40	55.40	73.00	95.10
Pueblo,Colo. W12	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St.Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.89c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct .0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling—Ingot	Rerolling—Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base Cold Rolled 10%	Strip, Carbon Base Cold Rolled Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa. deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
Granite City,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos.0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% SI or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% SI to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglet, 16% SI, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§	Structural Shapes	Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24 #	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85 #	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30 #	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45 #	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53 #	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25 #	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95 #	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25 #	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [5]—1000 to 4999 lb; [6]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:	
Carbon, Forging Quality (net ton)	$97.00
Alloy (net ton)	115.00
Wire Rods:	
Carbon, 5/32" to under ¼ in.	5.30
Carbon, ¼ in. to 47/64 in.	5.70
Alloy	6.40
Wire (carload lots)	8.40
Bars & Small Shapes:	
Carbon, merchant quality	5.40
Carbon, special quality	5.85
Alloy	6.40
Bar Mill Bands:	
Carbon	5.40
Alloy	8.05
Structural Size Angles & Zees	5.40
Plates:	
Carbon	5.45
Sheets & Coils, Hot Rolled:	
Carbon Sheets	5.00
Carbon Strip	5.00
Sheets & Coils, Cold Rolled:	
Carbon Sheets	6.35
Carbon Strip (0.080 and lighter)	6.35
Carbon Strip (0.081 and heavier)	6.65
Sheets & Coils, Galvanized:	
Standard Quality	6.70
Culvert Quality	7.00
Sheets, Porcelain Enameling	7.45
Sheets & Coils, Electrical:	
Field Grade	9.00
Armature Grade	9.50
Electrical Grade	10.15
Tin Mill Products (Per Base Box; 100 lb basis wt)	
Coke Tin Plate (1.25 lb pot yield)	$0.60
Electrolytic Tin Plate (0.25 lb coating.)	9.10
Black Plate	8.30
Nails, c.l. lots, 400 keg min. (per keg)	$8.15

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10§
40 mesh, bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50.	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.10-50.70†
Bronze, 5000-lb lots	52.20-56.20†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	52.70-57.10†
Phosphor-Copper, 5000-lb lots	64.60
Copper (atomized) 5000-lb lots	45.10
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20†
Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom.**
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition: ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.80	$5.80	$5.75	$5.65	$6.11
Bar Size Angles	5.30	5.30	5.25	5.10	5.56
Structural Angles	5.68	5.68	5.63	5.53	5.98
I-Beams	5.31	5.31	5.31	5.21	5.65
Channels	5.26	5.26	5.26	5.16	5.60
Plates (basic bessemer)	5.65	5.65	5.60	5.50	5.96
Sheets, H.R.	8.30	8.30	8.30	8.10	8.60
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.52	9.52	9.47	9.37	9.83
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.58	9.58	9.53	9.43	9.89
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	8.60	9.12
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.76	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.68	6.68	6.58	6.52	6.75
Merchant Bars	5.90	5.90	5.85	5.65	6.11
Hot-Rolled Bands	7.15	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.70	5.70	5.70	5.50	5.85
Wire Rods, O.H. Cold Heading Quality No. 5.	6.30	6.30	6.30	6.20	6.55
Bright Common Wire Nails (§)	7.65	7.65	7.65	7.65	7.95

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld, E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.50-13.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Ovens Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, deld.	
Phenol, 90 per cent grade	14.75
Per net ton bulk, f.o.b. cars or trucks, plant	
Ammonium sulfate, regular grade	$32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max. P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. Charge Chrome 2: Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. Refined Chrome 2: Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload bulk 20.05c per lb of alloy, caroad packed, 21.25c, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; 'ess ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo., in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

Scrap Holding in Face of Strike

STEEL's index on No. 1 heavy melting steel is unchanged at $36.50 despite the cutting off of incoming shipments by many steelmakers preparing for plant shutdowns

Scrap Prices, Page 128

• **Pittsburgh**—With the strike deadline only a few days away, steelmakers aren't accepting any scrap or placing new orders. But despite the inactivity, prices remain firm. Low phos material is strong because there isn't enough around to satisfy even a limited demand. Dealers expect better prices in July if a strike is averted. Steelmaking will continue at a fairly high level, forcing some mills to replenish their inventories.

• **Philadelphia** — Despite curtailed shipments to some plants threatened with a strike, there is a scarcity of steel scrap, and prices are $1 higher on No. 1 bundles and No. 1 busheling at $39, delivered. The scarcity is attributed to active demand for open hearth scrap for export and good prospects for a strong export movement next month.

• **New York** — Brokers' buying prices are unchanged except for No. 2 bundles which are higher at $17-$18. Despite curtailed shipments of steel grades to some plants threatened with a strike, there is enough business, particularly exports, to impart some strength to the market. The cast iron grades and stainless specialties are firm.

• **Chicago**—Cast iron grades of scrap continue to show strength as foundries buy actively, and prices are up $1 to $2 a ton. Steelmaking grades are at a virtual standstill, with the mills refraining from buying as the June 30 labor contract deadline approaches. The deadline for accepting delivery of material on order has passed.

Prices, generally, are unchanged, but they are regarded as nominal. Within a few days auto stampers will be taking bids on their No. 1 industrial bundles, and it is felt brokers' bids might be several dollars lower than a month ago.

• **Cleveland** — Shipments of scrap from dealers' yards to steel plants are at a virtual standstill. Some industrial material is still moving, largely to steelworks that won't be affected by a July 1 strike. Otherwise the market is inactive, with buying absent. Prices are unchanged but firm. Bids on auto lists at the end of June are expected to show little change from a month ago. Foundry grades are sluggish, with many casting shops preparing to close for mass vacations in July.

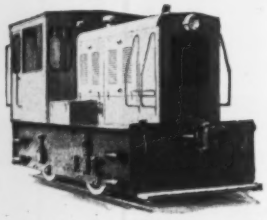
• **Detroit**—Dealers say the market is softer although no large orders have been filled to provide the basis for a definite price level.

• **Buffalo**—The flow of scrap to dis-

Choose Any Type or Make of Engine

ROGERS

INDUSTRIAL LOCOMOTIVES



Choose any of the standard diesel or gasoline engines. Your Rogers Locomotive will be so equipped with proven matching components.

Smooth, rapid acceleration and high, continuous tractive effort over the entire range will be assured. Shifting will be automatic.

Convenient controls that are safe and responsive allow ease of operation even to unskilled operators.

5 ton to 40 ton units for conventional or special requirements.

Write for literature.

ROGERS BROTHERS CORPORATION
ALBION, PENNA.

Export Office: 50 CHURCH ST., NEW YORK 7, N. Y., U.S.A.
Cable Address: ROGLOCO

If

METALWORKING PLANTS ARE YOUR PROSPECTS...

✔ ✔ ✔

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, O.

trict mills was cut off June 20 as preparations went forward for a strike shutdown July 1. The mills hold substantial inventories. Prices remain firm, and the market undertone is strong.

• **Cincinnati**—The market is quiet, but prices are firm. Little scrap is moving with most steelmakers anticipating a strike July 1. No. 1 heavy melting is still quoted by brokers at $33.50-$34.50.

• **St. Louis**—The market is in a wait-and-see period, pending outcome of steel labor negotiations. The mills are not actively in the market, and sellers are not anxious to sell large tonnages at the current low price level.

• **Birmingham** — More price increases are expected on grades that are in short supply despite a better flow of material to yards. Buying of electric furnace and foundry grades is steady.

• **Houston** — Some export buying and brokers' attempts to fill old Mexican orders account for the main activity in this market. The leading Texas mill will not resume buying until the industry wage dispute is settled. The mill at Lone Star purchased a moderate tonnage for shipment by July 15, but brokers have about covered their commitments on that order.

One exporter has scheduled a cargo loading for Japan out of Houston early in July. Most of the tonnage will come from the exporter's own yards.

Demand for cast scrap is up slightly, and prices are firm. Supplies are limited.

• **Los Angeles**—With the mills cutting off scrap intake after June 22, the movement of material in this market is at a virtual standstill. Dealers have let their yard inventories decline, but are expected to replenish stocks over the summer months in anticipation of better demand from the mills later this year.

• **San Francisco**—Domestic demand for scrap has just about dried up. The only support for the market is provided by foreign sales.

• **Seattle**—Consumers are holding back orders in anticipation of a strike at the end of the month. So the scrap market is at a standstill. Domestic demand is lacking, and foreign requirements are absent. There is little yard activity, and little new scrap being processed.

Scrap Consumption Slips Slightly During April

Consumption of ferrous scrap in April at 6,638,000 gross tons, was slightly lower than that in March when 6,677,499 tons were used, reports the U. S. Bureau of Mines. Pig iron consumption at 6,654,000 tons while down 5 per cent from the 6,798,053 tons used in the preceding month, was 1 per cent higher on a daily basis.

The total melt (scrap and pig iron) during the month was 13,292,000 gross tons, of which 49.0 per cent was scrap and 50.1 per cent was pig iron, comparing with 49.6 per cent scrap and 50.4 per cent pig iron in March.

Stocks of scrap held by domestic consumers on Apr. 30 were 8,277,000 tons, up slightly from the 8,242,936 held at the end of March. Stocks of pig iron at 3,070,000 tons were 3 per cent lower than the 3,171,999 tons held Mar. 31.

Home scrap produced in April accounted for 3,912,000 tons, a slight increase over the March total. Purchased scrap received by consumers amounted to 2,749,000 tons, 4 per cent less than in March.

Wire . . .

Wire Prices, Page 121

Most consumers of wire rods will enter July with inventories extending to 60 days. On finished wire items, however, most users' stocks will fall considerably under that level, though mill carryovers into third quarter will not be particularly large. As a matter of fact, the bulk of wire on order is expected to be shipped by the end of this month.

Consumption of wire products has been heavy this month, in some cases exceeding estimates. This has been notably the case with the automotive industry.

Relatively slight interest is noted in third quarter requirements. Some orders have been coming to the mills for that delivery, but there has been no rush to get on order books. To some extent this lack of urgency on the part of consumers

(*Please turn to Page* 133)

600
AIR-CONDITIONED
Guest Rooms
NOW you can be sure of an air-conditioned room when you come to Baltimore!
Teletype: BA 263.
The Lord Baltimore HOTEL

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, June 24, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 24	$36.50
June 17	36.50
May Avg.	33.58
June 1958	35.50
June 1954	27.92

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	31.00-32.00
No. 1 dealer bundles	40.00-41.00
No. 2 bundles	25.00-26.00
No. 1 busheling	40.00-41.00
No. 1 factory bundles	46.00-47.00
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Cut structurals:	
2 ft and under	*47.00-48.00*
3 ft lenghts	*46.00-47.00*
Heavy turnings	30.00-31.00
Punchings & plate scrap	*49.00-50.00*
Electric furnace bundles	*47.00-48.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	*52.00-53.00*

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	57.00-58.00
Random rails	*52.00-53.00*
Angles, splice bars	50.00-51.00
Railroad specialties	*51.00-52.00*
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	*230.00-235.00*
18-8 turnings	115.00-120.00
430 bundles & solids	120.00-125.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	35.00-36.00
No. 1 hvy melt., dealer	34.00-35.00
No. 2 heavy melting	*32.00-33.00*
No. 1 factory bundles	*39.00-40.00*
No. 1 dealer bundles	35.00-36.00
No. 2 bundles	24.00-25.00
No. 1 busheling, indus.	35.00-36.00
No. 1 busheling, dealer	34.00-35.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3 ft.	*45.00-46.00*
Punchings & plate scrap	*46.00-47.00*

Cast Iron Grades

No. 1 cupola	*52.00-53.00*
Stove plate	*49.00-50.00*
Unstripped motor blocks	*43.00-44.00*
Clean auto cast	*58.00-59.00*
Drop broken machinery	*58.00-59.00*

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Angles, splice bars	48.00-49.00
Axles	*59.00-60.00*
Rails, rerolling	*59.00-60.00*

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	28.00-29.00
No. 1 busheling	39.00-40.00
No. 1 bundles	39.00-40.00
No. 2 bundles	25.00-26.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	42.00-43.00
Electric furnace bundles	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00

CLEVELAND

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	25.00-26.00
No. 1 factory bundles	41.00-42.00
No. 1 bundles	36.00-37.00
No. 2 bundles	25.00-26.00
No. 1 busheling	36.00-37.00
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	39.00-40.00
Cut structurals, plates 2 ft and under	45.00-46.00
Low phos. punchings & plate	39.00-40.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	36.00-37.00
Clean auto cast	50.00-51.00
Burnt cast	37.00-38.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	37.00
No. 2 bundles	21.00
No. 1 busheling	37.00
Machine shop turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	*54.00*
Stove plate	46.00

Railroad Scrap

No. 1 R.R. heavy melt	38.00
Rails, 18 in. and under	49.00
Rails, random lengths	42.50
Rails, rerolling	54.50
Angles, splice bars	45.00

BIRMINGHAM

No. 1 heavy melting	32.50-33.50
No. 2 heavy melting	25.00-26.00
No. 1 bundles	36.00-37.00
No. 2 bundles	22.00-23.00
No. 1 busheling	36.00-37.00
Cast iron borings	14.00-15.00
Machine shop turnings	22.00-23.00
Short shovel turnings	26.00-27.00
Bar crops and plates	42.00-43.00
Structurals & plates	41.00-42.00
Electric furnace bundles	36.00-37.00
Electric furnace:	
3 ft and under	34.00-35.00
2 ft and under	35.00-36.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	40.00-41.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, 18 in. and under	48.00-49.00
Rails, rerolling	54.00-55.00
Rails, random lengths	40.00-41.00
Angles, splice bars	43.00-44.00

PHILADELPHIA

No. 1 heavy melting	38.00
No. 2 heavy melting	32.00
No. 1 bundles	*39.00*
No. 2 bundles	24.00
No. 1 busheling	*39.00*
Electric furnace bundles	39.00
Mixed borings, turnings	20.00†
Short shovel turnings	24.00-25.00
Machine shop turnings	20.00
Heavy turnings	33.00-34.00
Structurals & plate	40.00-42.00
Couplers, springs, wheels	44.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy brakable cast	*42.00-43.00*
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	*17.00-18.00*
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Low phos. (structurals & plates)	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-43.00
No. 1 machinery	46.00-47.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	33.50-34.50
No. 2 heavy melting	28.50-29.50
No. 1 bundles	33.50-34.50
No. 2 bundles	23.00-24.00
No. 1 busheling	33.50-34.50
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	19.00-20.00
Cast iron borings	18.00-19.00
Low phos., 18 in.	43.00-44.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	41.00-42.00
Charging box cast	39.00-40.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	47.00-48.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	21.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	41.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable	27.00-28.00†
Foundry malleable	41.00-42.00
Unstripped motor blocks	38.00-38.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	20.00-20.50
No. 1 bundles	*26.00-27.00*
No. 1 busheling	*26.00-27.00*
Machine shop turnings	*10.00-11.00*
Short shovel turnings	*12.00-13.00*
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*19.00-20.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	19.00-20.00
No. 1 busheling	*29.00-30.00*
Machine shop turnings	12.00-13.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	13.00-14.00

Cast Iron Grades

No. 1 cupola	*45.00-46.00*
Stove plate	35.00-36.00
Charging box cast	36.00-37.00
Heavy breakable	36.00-37.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	50.00-51.00

SEATTLE

No. 1 heavy melting	35.00
No. 2 heavy melting	33.00
No. 1 bundles	27.00†
No. 2 bundles	22.00
Machine shop turnings	17.00
Mixed borings, turnings	17.00
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	18.00
Machine shop turnings	17.00
Shoveling turnings	19.00
Cast iron borings	19.00
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

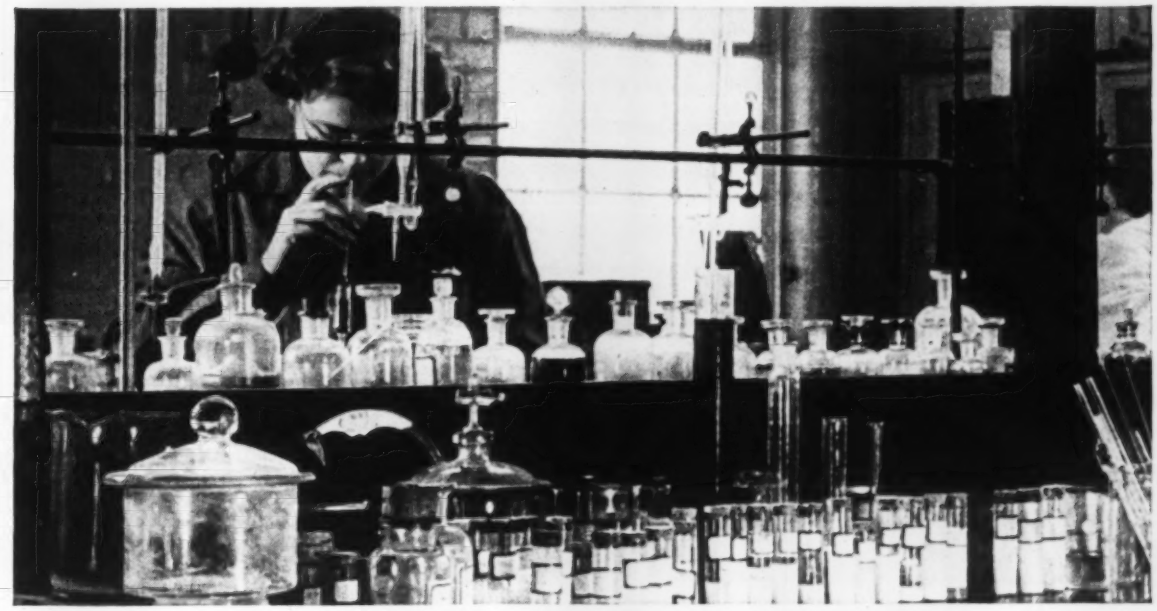
No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory:	
Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.
‡F.o.b. Hamilton, Ont.

THE U. S. TREASURY SALUTES THE CHEMICAL INDUSTRY



—and its people who buy Savings Bonds and strengthen America's Peace Power

Every family and every industry in this country benefit, directly and indirectly, from the work of our great chemical industry. Those whose lifework is in chemistry may well take pride in the vast good that stems from their profession. Thousands upon thousands of people in the chemical field are proud, too, of their share in America's Peace Power, for they are making regular purchases of U.S. Savings Bonds.

Buying Shares in America through the Payroll Savings Plan is a convenient and systematic way to practice thrift. It helps these patriotic people enhance their resources for home building, for education and for greater security after retirement.

If your company has not yet installed a Payroll Savings Plan, start at once. The easy first step is to telephone your State Savings Bond Director for the help he will give you, gladly. Or write to Savings Bonds Division, U.S. Treasury Department, Washington 25, D. C.

JAMES C. VICKERS is pictured here practicing his highly specialized skills in one of our country's great chemical plants. Mr. Vickers is typical of the thousands of expert workers in this field who are buying U.S. Savings Bonds regularly. Mr. Vickers uses his company Payroll Savings Plan to make regular contributions to the Peace Power of his country.

STEEL
the Metalworking Weekly

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE.

Labor Key to Third Quarter

Demand will be generally good if there are no widespread walkouts even though the traditional summer dip will push sales below second quarter levels. All eyes are on steel

Nonferrous Metal Prices, Pages 132 & 133

LABOR holds the key to what happens to the nonferrous industry during the summer.

While a prolonged strike in any of the metals would hurt that particular industry, many metalmen believe their main problem centers around what happens in steel. Consensus is there will be a steel strike, but opinions are split about 50-50 as to whether it will be a short one or a whopper.

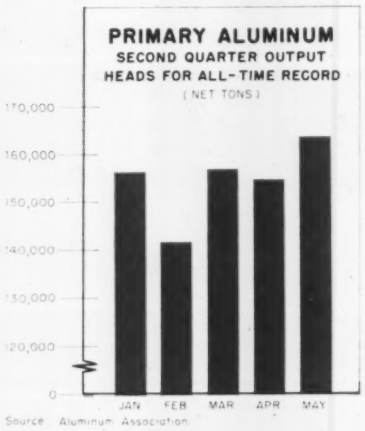
Each of the major nonferrous metals faces the possibility of a walkout this summer. But assuming there will be no major shutdowns, metalmen expect the industry to take its traditional dip in the third quarter. They point out that even though business would fall under the levels of the first and second quarters, demand should be good.

• **Copper**—Buying has eased some lately although a little inventory buildup is still going on. If there's no strike (copper or steel), metalmen expect the third quarter sales curve to resemble a saucer in profile—sales would fall gradually and hit a low in the latter half of July and early August, then begin to pick up in late August and September. (Chances of a copper walkout were lessened last week when the Mine-Mill Union said it would work past the June 30 expiration date.) The summer dip will be accentuated by some workoff of inventories.

The price pattern is also dependent on the labor situation. If there's no copper strike, the price of custom smelted metal will probably fall. Primary copper will either dip or hold the line at present levels. If there is a copper strike, U. S. producers probably will not raise prices because such a move would be meaningless if they have no metal to sell. But users will undoubtedly have to pay more for the foreign metal.

• **Aluminum** — Even if there's no aluminum industry strike, third quarter business will taper off to where it's under the second. Reason: Seasonal factors plus a certain amount of inventory workoff.

You can expect to pay more for your metal soon after new labor



Source: Aluminum Association

contracts are signed (most of the old ones expire on July 31). Guesses peg the rise as somewhere in the range of 1 to 2 cents a pound.

• **Nickel**—At best, there will be a moderate drop in demand in the third quarter. If there's a steel strike, there will be a big dip in sales. You don't have to worry about any shortages—there's plenty of nickel available.

Don't look for any price adjustments no matter what happens.

The recent hikes in nickel, Monel and Inconel sheets and plates reflect adjustments in production costs and don't signify a general increase in mill prices, observers say.

• **Lead** — Sales have been quiet lately. It's a normal reaction to the frantic buying wave of a few weeks ago, say metalmen. Customer inventories are pretty well stocked and there should be some workoff here and little rush for the metal over the summer, provided major facilities aren't closed down by labor troubles for an extended period.

Prices should hold close to present levels over the summer.

• **Zinc**—Third quarter sales will be fair even if there's a four to six week steel strike. If a strike doesn't materialize, producers expect excellent business, especially from galvanizers. At best, though, the third quarter probably won't match the second because of lower special high grade sales to automakers and less demand from brass mills for high grade.

If steelworkers strike, look for the zinc price to hold for several weeks, then drop if it continues. You can expect quotations to go up as soon as contracts are signed. A prolonged steel walkout would mean some curtailment in production.

Supplies will be adequate unless heavy labor walkouts hit the zinc industry. Users of special high grade would be the first to feel any pinch in demand.

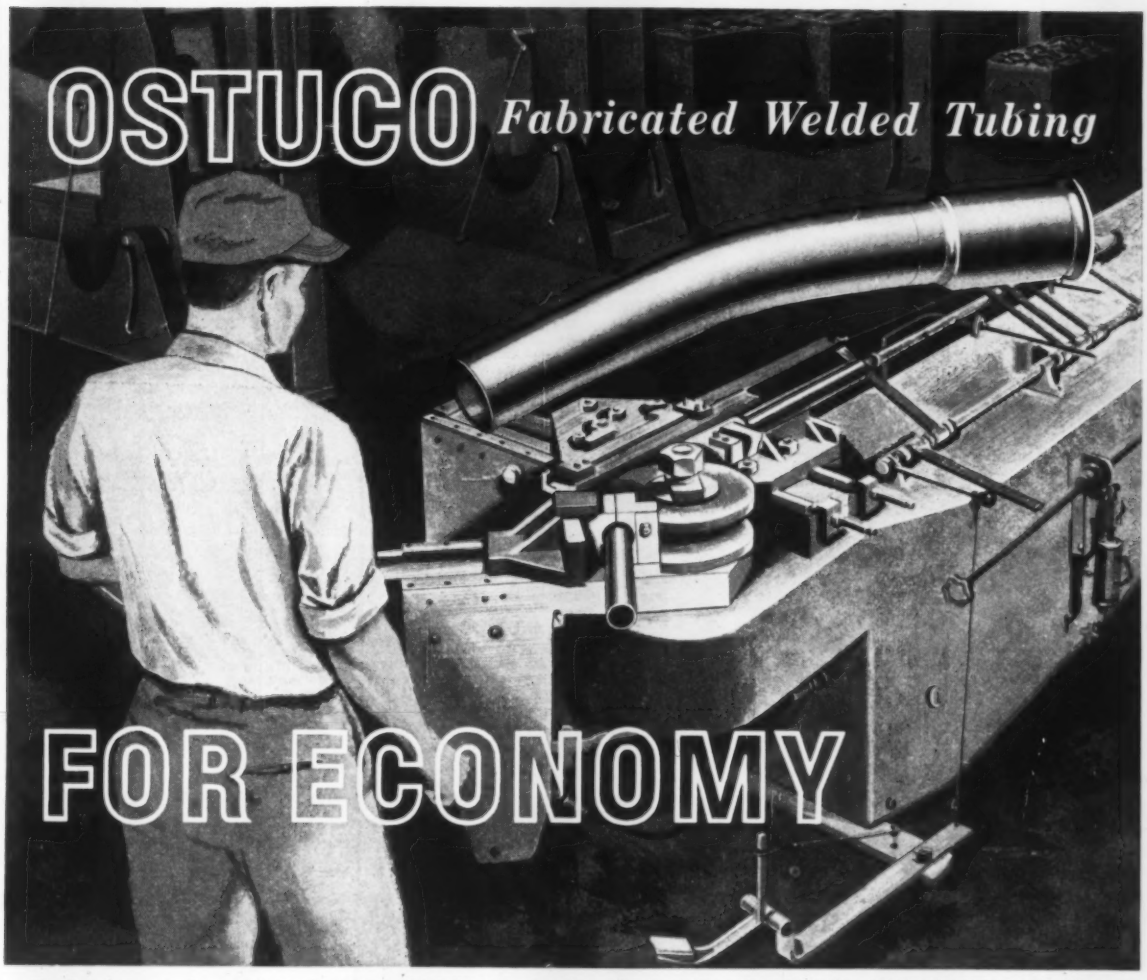
NONFERROUS PRICE RECORD

	June 24 Price	Last Change	Previous Price	May Avg	Apr. Avg	June, 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	31.00-31.50	June 24, 1959	31.50	31.750	32.404	25.400
Lead	11.80	May 7, 1959	11.30	11.700	10.992	11.040
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	103.625	June 23, 1959	103.75	103.080	102.490	94.701
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.

Vacuum Cleaner Manufacturer Specifies

OSTUCO *Fabricated Welded Tubing*



Bending vacuum cleaner wand. A variety of fabricating operations also is performed on Ohio Special Quality Seamless Tubing.

"Value analysis showed it would be more economical to buy than produce fabricated welded tubing parts for our new cleaner. What's more, we could avoid additional capital investment in equipment.

"So we added Ohio Seamless to our production line. They have the equipment and facilities to meet our design requirements and to hold to our stepped-up schedules. And we don't pay shipping costs on scrap — just on finished parts..."

Let Ohio Seamless translate your designs into finished parts... conserve your capital... cut your production and shipping costs. Contact your Ohio Seamless representative, listed in the Yellow Pages, or the mill at *Shelby, Ohio — Birthplace of the Seamless Steel Tube Industry in America.*

AA-8847

OSTUCO SHELBY, OHIO — OSTUCO TUBING

OHIO SEAMLESS TUBE DIVISION

of Copperweld Steel Company · SHELBY, OHIO

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

SALES OFFICES: Birmingham, Charlotte, Chicago (Oak Park), Cleveland, Dayton, Denver, Detroit (Huntington Woods), Houston, Los Angeles (Lynwood), Moline, New Orleans (Chalmette), New York, North Kansas City, Philadelphia (Wynnewood), Pittsburgh, Rochester, St. Louis, St. Paul, St. Petersburgh, Salt Lake City, Seattle, Tulsa, Wichita **CANADA:** Railway & Power Engr. Corp., Ltd. **EXPORT:** Copperweld Steel International Company, 225 Broadway, New York 7, New York

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 31.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $241-243 per 76 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., $9.85 per lb in lots of 2500 lb or more, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.00-2.20 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 103.625; prompt, 103.375.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.50; No. 5, 14.25 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.00; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 198 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass No. 115, 30.25; tin bronze, No. 225, 41.25; No. 245, 35.00; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bars, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

(Prices per lb, c.l., f.o.b. mill) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.90	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4*	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round. Class 1, random lengths, diam., 0.375-8 in. "F" temper: 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 23.75-24.25; No. 2 heavy copper and wire, 22.75-23.25; light copper, 19.25-20.25; No. 1 composition red brass, 17.75-18.25; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	48.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	....	....	19.375	19.125	18.625
Naval Brass	52.80	46.61	59.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 17.25-17.75; new brass clippings, 16.00-16.50; light brass, 11.25-11.75; heavy yellow brass, 12.25-12.75; new brass rod ends, 13.00-13.50; auto radiators, unsweated, 13.75-14.25; cocks and faucets, 14.25-14.75; brass pipe, 14.25-14.75.

Lead: Soft scrap lead, 7.75-8.25; battery plates, 2.50-3.00; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.75-10.25.

Monel: Clippings, 30.00-32.00; old sheets, 26.00-28.00; turnings, 20.00-22.00; rods, 30.-00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 7.25-7.75; segregated low copper clips, 14.75-15.25; segregated high copper clips, 14.25-14.75; mixed low copper clips, 15.00-15.50; mixed high copper clips, 12.25-12.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.25-16.75; mixed low copper clips, 16.50-17.00; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 26.25; No. 2 heavy copper and wire, 24.25; light copper, 22.00; refinery brass (60% copper) per dry copper content 24.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.25; No. 2 heavy copper and wire, 24.25; light copper, 22.00; No. 1 composition borings, 20.50; No. 1 composition solids, 21.00; heavy yellow brass solids, 15.00; yellow brass turnings, 14.00; radiators, 16.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 40.50, 2000-5000 lb lots; cast, 43.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; wire, 27.00; No. 2 heavy copper and wire, 26.00; light copper, 23.75; refinery brass deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 122.50; 200-499 lb, 121.00; 500-999 lb, 120.50; 1000 lb or more, 120.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.
Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,-000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 80.60; 100-600 lb, 71.20; 700-1900 lb, 68.40; 2000-9900 lb, 66.60; 10,000 lb or more, 65.20.

Stannous Chloride (Anhydrous): 25 lb, 156.20; 100 lb, 151.40; 400 lb, 148.90; 800-19,900 lb, 108.00; 20,000 lb or more, 102.00.

Stannous Sulphate: Less than 50 lb, 141.30; 50 lb, 111.30; 100-1900 lb, 109.30; 2000 lb or more, 107.30.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 127*)

is explained by the fact considerable wiremaking capacity will not be affected by a steel strike for several weeks after July 1 and most users tend to await clarification of the labor issue before acting on their forward needs.

Mesh has been moving well, but now there is some expectation that the highway programs may slow down in some states because of the lack of funds.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1245 tons, gymnasium and athletic building, St. John's University, Queens, N. Y., through Caristo Construction Co., Bronx, N. Y., general contractor, to Lehigh Structural Steel Co., Allentown, Pa.

950 tons, building, New York Telephone Co., Greenburgh, N. Y., through Stewart Muller, general contractor, to Elizabeth Iron Works, Union, N. J.

750 tons, gates, guides, etc., Ice Harbor Dam project, to Pacific Car & Foundry Co., Seattle; Guy F. Atkinson Co., South San Francisco, general contractor.

710 tons, plant building, Sunoline Chemical Co., Claymont, Del., through M. W. Kellogg Co., New York, to Levinson Steel Co., Pittsburgh.

678 tons, state bridgework, Onondaga County, New York, through Harrison & Burrows Inc., general contractor, to Harris Structural Steel Co., New York.

535 tons, state bridgework, Columbia County, New York, through D. V. Frione, general contractor, to City Iron Works, Weathersfield, Conn.

350 tons, maintenance hangar, Naval Construction Battalion Center, Davisville, R. I., to Groisser & Shlager Iron Works, Somerville, Mass.

140 tons, plant building, Mitre Corp., Bedford, Mass., to Groisser & Shlager Iron Works, Somerville, Mass.; Aberthaw Construction Div., Cabot, Cabot & Forbes, Boston, general contractor; reinforcing bars to Concrete Steel Co., Boston.

100 tons, 60 ton bridge crane for Hills Creek Dam, Oregon, to Maris Crane & Hoist Co. Inc., Philadelphia, third low at $69,565 to U. S. Engineer, Portland, Oreg.

STRUCTURAL STEEL PENDING

4000 tons, engineering center, Columbia University, New York; bids close June 30.

3000 tons, Lowry Air Force Base, Denver, Colo., Morrison Knudsen, Los Angeles, low on the general contract.

2820 tons, Morgan Street bridge, interchange viaducts, Hartford-Springfield Expressway, Hartford, Conn.; bids July 13, Hartford; also, 1695 tons of reinforcing bars and 1850 tons of steel piling.

2800 tons, state viaduct, Hartford, Conn.; bids July 13.

1365 tons, state highway structures, Danbury-Bethel-Brookfield and Newton, Conn.; bids July 13, Hartford, Conn.; also 790 tons, concrete reinforcing bars, and 120 tons of steel piling.

1820 tons, state bridgework, Essex and Passaic counties, New Jersey, bids July 15; also required are 1288 tons of reinforcing bars and 1177 tons of sheet piling.

1360 tons, 11 state bridges (Connecticut), Danbury-Bethel-Brookfield-Newtown, bids July 13.

940 tons, five state beam bridges, Lebanon, Conn., Angelo Tomasco, New Britain, Conn., low on the general contract.

450 tons, powerhouse, New York State University, Albany, Depot Construction Co., New York, low on the general contract.

250 tons, I-beam bridge, Waterville-Fairfield, Maine; Frank Rossi, Gardiner, Mass., general contractor; also 215 tons, concrete reinforcing bars.

150 tons, 3 span composite wide flange beam bridge, Concord, Vt.; bids July 3, Montpelier, Vt.; also 95 tons of concrete reinforcing bars.

135 tons, single span composite beam bridge, including concrete bars, Byram River, Greenwich, Conn.; bids June 28, Hartford, Conn.

130 tons, 2 span composite girder bridge, Willington, Conn.; Jarvis Construction Co. Inc., Manchester, Conn., low on the general contract.

100 tons, state bridgework, Bergen County, New Jersey, bids July 9; also required are 42 tons of reinforcing bars.

100 tons, including H-piling, two span, Aurora bridge, Alaska; Fred Nygren Inc., Delta Junction, Alaska, low at $92,317 to Public Works, Department, Juneau, Alaska.

100 tons, 18 stoplogs and lift beam, Bonneville Dam; Gate City Steel Inc., Boise, Idaho, low at $15,257 to U. S. Engineer, Portland, Oreg.

REINFORCING BARS . . .

REINFORCING BARS PLACED

340 tons, state highway structures, Medford-Stoneham, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through C. J. Maney Co., Lexington, Mass., general contractor.

275 tons, two dormitories, Pembroke College, Brown University, Providence, R. I., to Bethlehem Steel Co., Bethlehem, Pa., through J. L. Marshall & Sons Inc., Pawtucket, R. I.

255 tons, Washington State, two highway spans, King County; bids to Olympia, Wash., July 7.

170 tons, sewage disposal plant, Barre, Vt., to Truscon Steel Div., Republic Steel Corp., Youngstown.

125 tons, Washington State highway bridge, Mills Inc., Seattle; Wilder Construction Co., Whatcom County, to Northwest Steel Rolling Bellingham, Wash., general contractor.

CLASSIFIED

FOR SALE LESS THAN MILL PRICE
NEW PLATE
90 tons 5/16 x 18 x 72 nickel chrome moly SAE 8630 annealed, P. & O. on skids.
BARKSDALE MFG. CO.
Blytheville, Ark.

STRUCTURAL STEEL SHOP
For Sale or Lease
In path of great industrial expansion, in California. 250-ton monthly fabricating capacity. Land, buildings, machinery, $105,000.
Reply Box 772, STEEL
Penton Bldg., Cleveland 13, Ohio

METALS EDITOR
Editor for Engrg materials Magazine in NYC. Prefer metallurgist or metallurgical engineer with a few years in industry. Demonstrated ability to write is essential. Send resume of education, experience, references and salary requirements. **Box 774, STEEL, Penton Bldg., Cleveland 13, Ohio.**

Help Wanted

METALLURGICAL ENGINEER—Excellent opportunity for recent graduate or metallurgist with up to two years' experience. Position is concerned with research on a variety of materials and manufacturing processes. Please submit resume and salary requirements to: Personnel Administrator, Research Department, Plumbing and Heating Division, American-Standard, 834 East Broadway, Louisville 4, Kentucky.

Don't wait
till you need
Dependability-

Get it NOW
with

H & S Helical Gears

H & S Helical Gearing with overlapping tooth action is your ideal choice for power transmission on parallel shafts where speeds are high, where loads are high, and where smooth action is desired. Here's why —

- Correct machining of blank and accuracy of tooth generation reduce impact and increase load carrying capacity.
- Extra heavy rims, arms and hubs provide greater strength and stability.

H & S Helical Gears are available with diameters up to 125", 1 D.P. and 40" face.

It will pay you to learn more about the extra quality built into every H & S Gear. Send us your requirements. Quotations will be forwarded by return mail.

Send for your free copy of H & S Gear Catalog No. 57.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue
Cleveland 14, Ohio

Unstated, five story dormitory, etc., Oregon State College, Corvallis; A. V. Peterson, Portland, Oreg., low at $873,468 to Board of Higher Education.

Unstated, Northwest Memorial Hospital, Seattle; Anderson Construction Co., Tacoma, Wash., low at $1,399,173.

Unstated, Oregon state highway projects, bids July 1, to Salem, Oreg.; Linn and Lane Counties, six undercrossing structures; Multnomah County, toll facilities, interstate bridge; Yamhill County, 704 ft concrete bridge, South Yamhill River.

Unstated, 266 ft, 5 span Oregon state highway project, Multnomah County; general contract to Kuckenberg Construction Co., Portland, Oreg., low at $128,372. general contractor.

REINFORCING BARS PENDING

1288 tons, state bridgework, Essex and Passaic counties, New Jersey, bids July 15; also required are 1820 tons of shapes and 1177 tons of sheet piling.

PLATES . . .

PLATES PLACED

1765 tons, special treatment, dimpled, Navy Purchasing Office, Washington, D. C., to U. S. Steel Corp., Pittsburgh, at $845,579.

1595 tons, Naval shipyards, Portsmouth, N. H., to Lukens Steel Co., Coatesville, Pa., at $944,796.

1335 tons, high tensile, grade Hy-80, Navy Purchasing Office, Washington, D. C., to U. S. Steel Corp., Pittsburgh.

865 tons, high tensile, grade Hy-80, Navy Purchasing Office, Washington, D. C., to Lukens Steel Co., Coatesville, Pa.

700 tons, 48 in. steel welded water pipe for Everett, Wash., subcontracted to United Concrete Pipe Corp., Auburn, Wash.; Butler Construction & Engineering Co., Seattle, general contractor.

580 tons, special treatment (annealed), Navy Purchasing Office, Washington, D. C., to Lukens Steel Co., Coatesville, Pa., at $262,780.

525 tons, 3-million-bushel grain elevator addition, Cargill Inc., Chicago, to the Chicago Bridge & Iron Co., Chicago.

400 tons, 30 in., ¼ in., steel water pipe for Port Townsend, Wash., to Hydraulic Supply Mfg. Co., Seattle.

385 tons, high tensile, grade Hy-80, Navy Purchasing Office, Washington, D. C., to U. S. Steel Corp., Pittsburgh.

240 tons, tankwork, Texaco Inc., Bayonne, N. J., to Chicago Bridge & Iron Co., Chicago.

200 tons, including shapes, 263 ft all-welded steel barge for Foss Launch & Tug Co., Seattle, to Puget Sound Bridge & Dredging Co., Seattle.

PLATES PENDING

545 tons, two contracts, General Stores Supply Office, Navy, Philadelphia; bids July 9.

500 tons or more, 950 ft, 84 in. diameter, ¼ to ¾ in., steel penstocks, also structurals for powerhouse; bids to Sitka, Alaska, probably in July; Carey & Kramer, Seattle, engineer.

195 tons, alloy, General Stores Supply Office, Navy, Philadelphia; bids July 6.

Unstated, two additional tanks for Standard Oil Co. of California tank farm, Pasco, Wash.; bids soon.

PIPE . . .

CAST IRON PIPE PLACED

617 tons, 2 to 12 in., Ketchikan, Alaska, to Pacific States Cast Iron Pipe Co., Portland, Oreg.

165 tons, 6 to 12 in., Bremerton, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

151 tons, 6 to 12 in., Shelton, Auburn, and District No. 20, King County, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

80 tons, 6 to 12 in., for Districts No. 20 and 85, King County, to Pacific States Cast Iron Pipe Co., Seattle.

Advertising Index

Aetna-Standard Division, Blaw-Knox Co. ... 33
Alco Products, Inc. 17, 18, 19, 20
Allied Oil Co., Division of Ashland Oil & Refining Co. ... 73
Amchem Products, Inc. ... 62
American Steel Warehouse Association 136
American Welding & Mfg. Co., The 36
Ashland Oil & Refining Co., Allied Oil Co. Division ... 73

Bailey, William M., Co. ... 89
Barksdale Mfg. Co. ... 133
Bethlehem Steel Co. ... 1
Blaw-Knox Co., Aetna-Standard Division 33
Boston Gear Works ... 14
Buffalo Forge Co. ... 15

Chicago Steel Service Co. ... 105
Cincinnati Milling Machine Co., The, Grinding Machine Division ... 57
Cleveland Worm & Gear Co., The ... 44
Consolidated Machine Tool Division, Farrel-Birmingham Co., Inc. ... 70
Cooper-Bessemer ... 11
Copperweld Steel Co., Aristoloy Steel Division 65
Copperweld Steel Co., Ohio Seamless Tube Division ... 131
Crucible Steel Company of America ... 119

Detroit Steel Corporation ... 42

Erie Foundry Co. ... 7

Farrel-Birmingham Co., Inc., Consolidated Machine Tool Division ... 70

General Dynamics Corporation, Stromberg-Carlson Division ... 113
General Refractories Co. ... 75
Gisholt Machine Co. ... 107
Great Lakes Steel Corporation ... 26, 27

Harbison-Walker Refractories Co. ... 92
Harnischfeger Corporation ... 8, 9
Heald Machine Co., The .... Inside Front Cover
Horsburgh & Scott Co., The ... 134

Jones & Laughlin Steel Corporation ... 90, 91
Jones & Laughlin Steel Corporation, Stainless & Strip Division ... 108

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division ... 58
Koppers Co., Inc., Engineering & Construction Division ... 24, 25

Lamson & Sessions ... 2
LeBlond, R. K., Machine Tool Co., The 4
Lewellen Manufacturing Co. ... 10
Lincoln Electric Co., The ... 32
Link-Belt Co. ... 78
Lord Baltimore Hotel, The ... 127

Malleable Castings Council ... 22, 23
Metal & Thermit Corporation ... 21

National Automatic Tool Co., Inc. 101, 102
National Steel Corporation ... 26, 27
Norton Co. ... 31

Ohio Crankshaft Co., The ... 3
Ohio Seamless Tube Division of Copperweld Steel Co. ... 131

Pittsburgh Crushed Steel Co. ... 16

Republic Steel Corporation ... 12, 13
Rockford Machine Tool Co. ... 28, 29
Rogers Brothers Corporation ... 126
Ryerson, Joseph T., & Son, Inc. ... 41

Sciaky Bros., Inc. ... 30
Screw & Bolt Corporation of America ... 69
Sharon Steel Corporation ... 60, 61
Simonds Saw & Steel Co. ... 98
Standard Pressed Steel Co., Nuclear Products Division ... 34
Steel Equipment Co. ... 95
Stromberg-Carlson, A Division of General Dynamics Corporation ... 113
Sun Oil Co. ... 35
Surface Combustion Corporation ... 66

Threadwell Tap & Die Co. .. Inside Back Cover
Timken Roller Bearing Co., The .... Back Cover

United States Rubber Co., Mechanical Goods Division ... 87

Verson Allsteel Press Co. ... 120

Washington Steel Corporation ... 112

Yoder Co., The ... 6

~ ~ ~

Table of Contents
Facing Inside Front Cover

Classified Advertising, Page 133

Coming
July 13
IN
STEEL

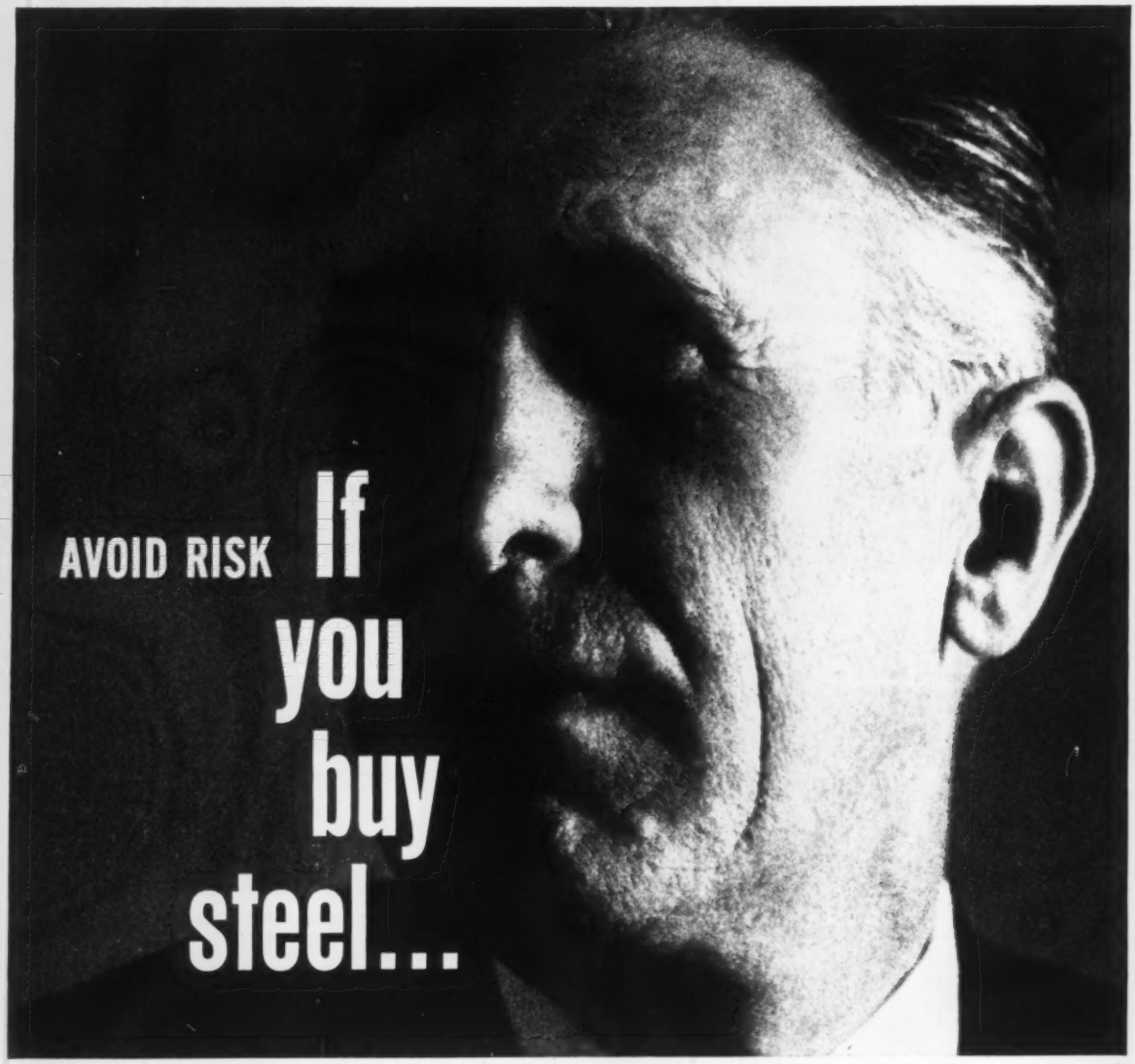
Keeping Pace with Technology

Superior technological improvements can go a long way toward pushing productivity higher and stemming inflation.

Are you taking advantage of explosive forming, chemical milling, numerical control—or any of the other new production techniques bursting forth in this Sputnik Age? The next article in STEEL's 1959 Program for Management will tell how you're missing a bet if you're not.

Articles in the series published to date:

1. **Profile of Metalworking's Managers (Feb. 16, p. 137).**
2. **Improving Productivity (Mar. 16, p. 103).**
3. **Keeping Wages in Line (Apr. 13, p. 95).**
4. **Giving More Public Service (May 18, p. 99).**
5. **Meeting Foreign Competition (June 15, p. 131).**



USE OUR CAPITAL to cut your storage space costs

Using our large steel stocks saves you the costs of a big chunk of expensive storage space. And you can free-up and convert this tied-up space to more productive, profitable use. That's good business.

Since our labor, our equipment cuts your steel, does preliminary processing for you . . . you save the investment—the costs—of using your own labor and equipment. You save handling expense and other inventory costs. Whatever your steel need, there's a nearby Steel Service Center set up to serve you quickly from stock.

If you're putting steel in your inventory because you think it's a bargain, compare *all* of your costs of possession with the cost and *freedom-from-risk* of buying steel from your Steel Service Center. Use this chart. Or, to be more precise, get the booklet, "What's your real cost of possession for Steel" from your convenient Steel Service Center. American Steel Warehouse Association, 540 Terminal Tower, Cleveland 13, O.

COST OF POSSESSION FOR STEEL IN YOUR INVENTORY

Per ton delivered	
Cost of capital:	
Inventory	
Space	
Equipment	
Cost of operation:	
Space	
Materials handling	
Cutting & burning	
Scrap & wastage	
Obsolescence	
Insurance	
Taxes	
TOTAL	

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

Per ton, cut-to-size, and delivered

TOTAL

AMERICAN STEEL WAREHOUSE ASS'N

The American Steel Warehouse

...YOUR STEEL SERVICE CENTER

BUSINESS IS UP

Get your share and keep it there!

Threadwell

MAKES THE BEST PRODUCT BETTER

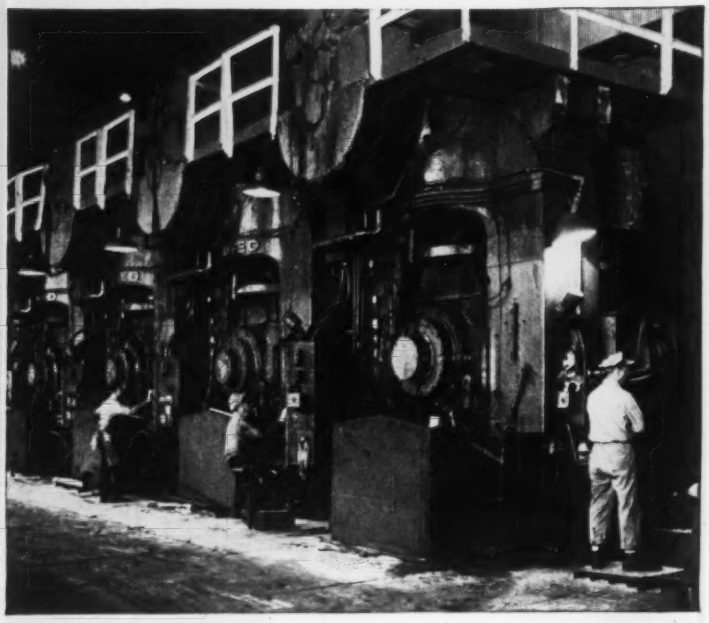
INDUSTRIAL DISTRIBUTION — SERVING INDUSTRY ECONOMICALLY — THE RIGHT HAND OF PRODUCTION

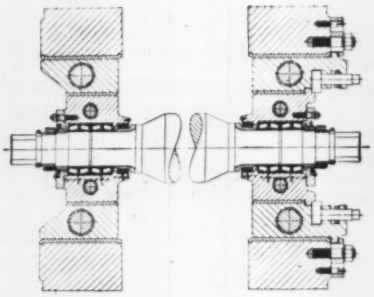
Threadwell's fine line of cutting tools and gages is one guarantee of uninterrupted production, the surest way to stay in a competitive position.

To get out front and stay there make sure you include your Threadwell Distributor in your production planning.

THREADWELL TAP & DIE CO.
GREENFIELD, MASSACHUSETTS

Stocking Warehouses: New York — Cleveland
Detroit — Los Angeles — Greenfield, Mass.





UNITED ENGINEERING mounts the work roll necks on the 4-high cold rolling mill on Timken tapered roller bearings to give lower cost per ton of steel rolled.

How Weirton cold rolls steel up to 5,000 F.P.M.

COLD rolling steel up to 5,000 F.P.M. calls for bearings with real guts. That's why United Engineering specified Timken® tapered roller bearings on the work roll necks of this 4-high tandem cold mill built for Weirton Steel Company, Division of National Steel Corporation. And to maintain gage and quality at these high speeds, they specified Timken bearings on the mill gear drives and pinion stands, tension reel, payoff reel screwdown drive, the coil transfer car, coil rotating rig and for the tilting gear drive for the coil unloader.

Timken tapered roller bearings have the high radial and thrust capacity you need for modern steel mills. They're tapered to take any combination of radial and thrust loads. And they're case-carburized to produce hard, wear-resistant surfaces over tough, shock-resistant cores. Both are reasons why Timken bearings have records in steel mills the world over.

Because Timken bearings practically eliminate friction, cut starting resistance, they cut scrap losses to a bare minimum. Grease lubricated, they cut maintenance costs to the bone. It all adds up to lower bearing cost per ton of steel rolled . . . why Timken tapered roller bearings are on the roll necks of 1,008 mills.

Specify Timken tapered roller bearings for the next rolling mill you buy or build. They make good machines better, help turn out a better product for less money. And with Timken bearings you get the best engineering service there is. That's Better-ness. And Timken bearings are the symbol of Better-ness. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.

BETTER-ness rolls on TIMKEN® tapered roller bearings